United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation
with the
Texas AgriLife
Research

Soil Survey of San Augustine and Sabine Counties, Texas

How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

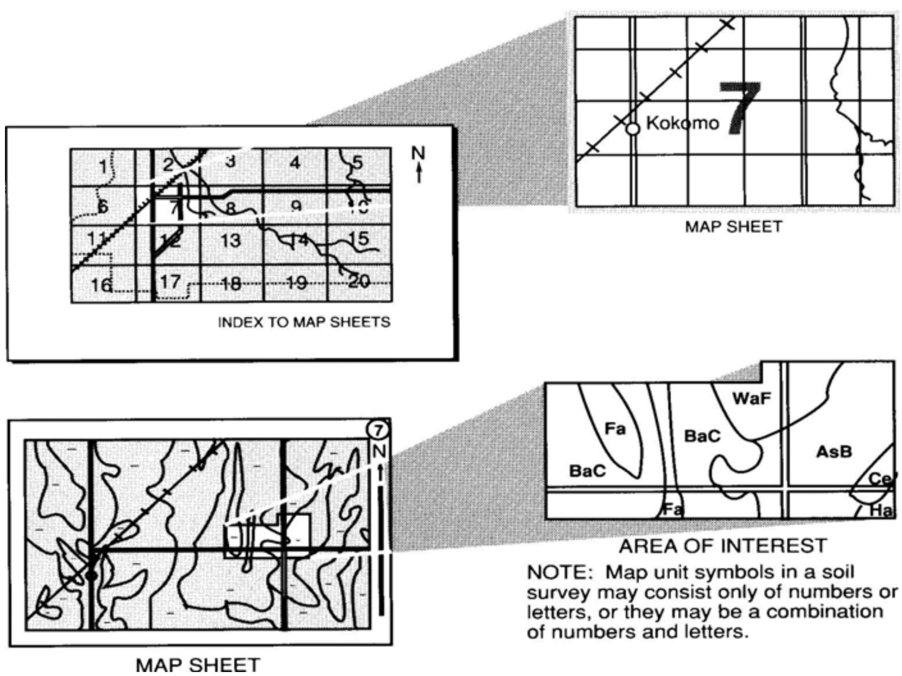
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Go to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 2006. Soil names and descriptions were approved in 2006. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2006. This survey was made cooperatively by the Natural Resources Conservation Service, U.S. Forest Service, U.S. Corp of Engineers, the Texas AgriLife Research, and Texas Soil and Water Conservation Board. The survey is part of the technical assistance furnished to the Piney Woods Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Sam Rayburn Reservoir used to prevent flooding, generate electricity, and provide drinking water for cities, towns, and communities. Also provides a source for recreation for the East Texas residents and visitors.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is *http://www.nrcs.usda.gov*

Contents

2009

Foreword

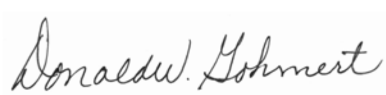
This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Texas AgriLife Research.



Donald W. Gohmert
State Conservationist
Natural Resources Conservation Service

Soil Survey of San Augustine and Sabine Counties, Texas

By Kirby Griffith, Natural Resources Conservation Service

Field work by Kirby Griffith, Lynn Gray, Don Sabo, Joel Bolin, Joseph J. Castille, Levi Steptoe, and Cherie Edwards, Soil Scientists, Natural Resources Conservation Service.

United States Department of Agriculture, Natural Resources Conservation Service

San Augustine and Sabine Counties are in extreme East Texas (fig. 1). San Augustine is about 35 miles east of Nacogdoches and about 70 miles southwest of Shreveport, Louisiana. San Augustine County borders Shelby County to the north, Nacogdoches County on the west, Angelina County on the southwest, Jasper County on the southeast, and Sabine County on the east. Sabine County borders Shelby County on the north, San Augustine on the west, Jasper County on the southwest and Newton County on the southeast, and Toledo Bend Reservoir and the Louisiana state line to the east.

San Augustine and Sabine Counties have a total area 747,948 acres with 95,351 acres of water and 652,597 acres of land. The land area consists of 167,469 acres of U.S. Forest Service land, 3,350 acres of U.S. Army Corp of Engineers land, and the remaining 485,128 acres is private ownership. Elevation ranges from 200 to 620 feet above sea level. The average rainfall is about 50 inches and the frost-free growing season is about 237 days.

At present most of the land is used for timber production. About 50,000 acres is used as improved pasture and hayland and a small amount of acreage is used for truck crops and tree farms. The acres of woodland serve as multiple uses for hunting, recreation, and wildlife along with the production of forest products. Many of the flooded bottomlands are used by ducks during the winter and the wetland areas are used by wood ducks throughout the year. Improved pasture is used extensively for the production of beef cattle.

Soil diversity is complex. Upland soils range from thick sandy deposits to dense plastic clays. Bottomland soils range from sandy to loamy and from well drained and occasionally flooded, to poorly drained and frequently flooded for long durations. There are 14 geologic formations in the county. There are two rivers that are used as boundary line for the survey area. They are the Attoyac River on the west and the Sabine River on the east.

General Nature of the Survey Area

This section provides general information about San Augustine and Sabine Counties. It describes the history, agriculture, natural resources, and climate of the survey area.

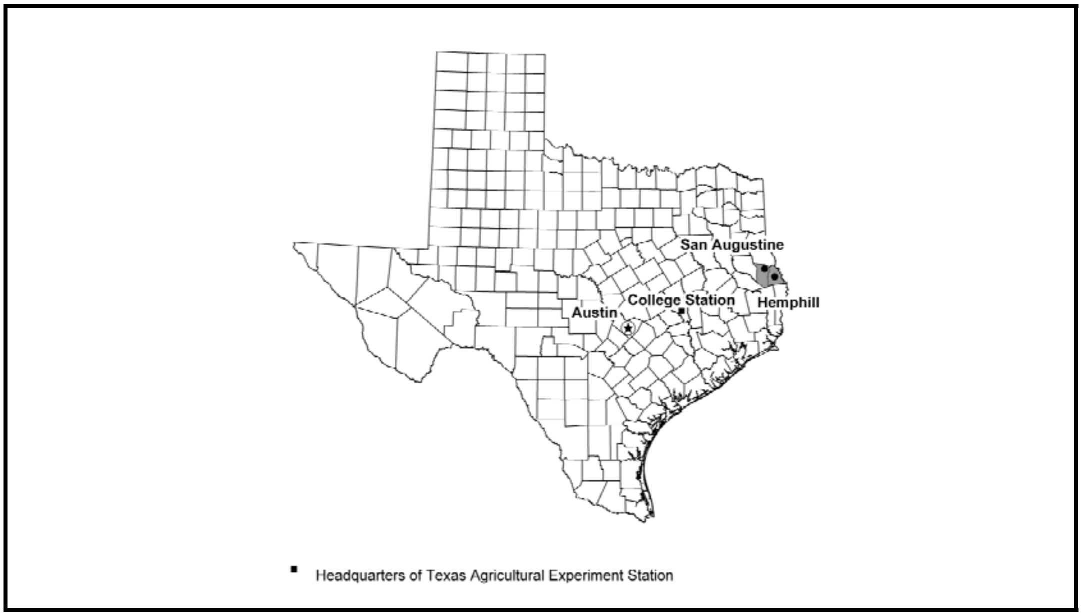


Figure 1.—Location of San Augustine and Sabine Counties, Texas.

History

The first settlers that came to East Texas found pine trees and hardwood trees that extended for miles. The Caddo Indians and various wandering tribes lived in the timberlands for thousands of years with little impact. The Caddoan tribes were agricultural, with a stable society. The vast forest was dominated by bison, elk, turkey, panther, bobcats, and black bear.

Farming was the intent of the first settlers. Cotton cultivation began in San Augustine County in 1825. From the Texas Revolution through the American Revolution, cotton, corn, sugarcane, rice, wheat, and tobacco were ginned, milled, or processed locally. Hogs were a huge commodity along with some cattle. Dairies were also common in the counties.

The rivers, bayous, and streams of San Augustine and Sabine Counties were not very conducive to shipping timber products by water. These early settlers had to sell their product locally or consume it themselves. The invention of the narrow gauged, steam-powered train made it feasible to carry large loads of logs to mills. By 1910, there were over 600 sawmills in Texas. The two counties had a total of 315 sawmills and 25 railroads and trams. Virgin stands were harvested with no intent of restoration.

By 1900, the wildlife habitat had been severely damaged. Watercourses had silted in and erosion was rampant. Gone were the elk, turkey, bison, panther, and bear. Their hides and meat used to supply the hungry workers of the sawmill industry. The oil from the bear fat was highly sought after, to waterproof the boots of workers and to keep the leather drive belts of sawmills supple. The land, after massive abuse, reproduced brush with few pine trees. This created a biological desert for the plants and animals that had evolved in the area.

In the late 1890's, the U.S. Department of Agriculture began working to restore the forest and develop plans for a renewal forest industry. The Angelina National Forest and the Sabine National Forest were commissioned to restore the forestlands.

By the late 1960's, farming was on a steep decline. Large corporations were dominating the lumber business.

Settlement of San Augustine County

San Augustine County was one of the first counties to be formed in 1837. By the 1840s these residents enjoyed economic success that would not come again. Corn and cotton, the major crops, were transported to market in Louisiana by wagon.

By 1850 the county population was 3,648. In 1854 the first courthouse was erected, and public roads were maintained by order of the county court. The court also established ferries over unfordable streams and creeks. San Augustine was still the center of community activity and had the only post office in the county.

In 1901 the Gulf, Beaumont and Great Northern Railroad built a line through the county, with a rail stop in the county seat. The St. Louis and Southwestern Railway also extended a line into the southern part of the county, and rail towns like Warsaw, Veach, and Broaddus developed. The Nacogdoches and Northeastern Railroad extended a rail line into the county, as did some lumber companies.

As both the population and economy developed, county residents realized the need for better, more modern facilities. In 1927, the old courthouse, constructed in 1890, was torn down and replaced with a stone structure. Many of the roads were graveled. In San Augustine, citizens had access to city-owned water, electric, and sewage utilities, as well as an ice plant and natural-gas services.

In 1965, the United States Army Corps of Engineers completed Sam Rayburn Dam, thus forming Sam Rayburn Reservoir and inundating the Angelina and Attoyac Rivers. The county contains approximately 65,738 acres of the Angelina National Forest and the 4,317 acres of Sabine National Forest. Recreational facilities in the woodlands and along the lakes attracted large numbers of visitors, and tourism became a new and important source of income.

Settlement of Sabine County

Sabine County was named for the Sabine River. The original inhabitants of the area were the Ayish tribe of the Caddo Indians.

In the mid-1820s, a Ferry was established to cross the Sabine River allowing settlers to develop communities in the area. In 1828, the town of Milam was established in the northern part of what is now Sabine County. Milam was the original county seat, but as early as 1850 settlers began to petition the government for a more centrally located county seat on the grounds that Milam was more than five miles from the geographic center of the county. In August 1858 an election was held, and 160 out of 260 votes were cast in favor of relocation. However, the election was invalidated because there was not an official survey proving Milam was outside the five-mile limit. In November 1858, a survey of the area showed Milam to be six and three-quarter miles from the center of the county, so the new town of Hemphill was established at the center of the county, which became the new county seat. The town was named in honor of John Hemphill, a former Texas Supreme Court justice, who at the time was serving as a United States senator.

Agriculture

San Augustine County

The 1850 census reported 109,713 acres of farmland, with the majority of acres unimproved. Farmland was used primarily to run livestock, particularly hogs, and to grow subsistence crops. Corn was the major crop, used for family consumption as well as livestock feed. Cotton, wheat, tobacco, and rice were grown. By 1860, cotton production

boomed and bales were being delivered to the Shreveport, Natchitoches, or New Orleans markets in ox-drawn wagons. The wheat crop, milled locally for home consumption, increased, but corn was still the staple crop.

By the beginning of World War II the local economy was fairly stable. Farming remained the prevalent occupation, and in unsuccessful years farmers sold timber to offset their losses. Corn, cotton, lumber, and poultry were the most abundant productions. Only three industries, which employed thirty-three people, had survived the depression. Some of the roads were now hard-surfaced, so truck farming was even more feasible. But overall, things were much as they had been before the economic boom of the early 1900s. Many of the young people who left the area during the war chose not to return, and others moved to more metropolitan areas, especially Houston and Dallas, in search of jobs. By 1950 the county population had decreased, reducing the number of farms, and corn production declined by 50 percent. Dairy farming had become virtually nonexistent, but cattle herds increased as ranching began to replace farming as a major source of income. Former cotton fields became pasturelands.

Farming continued to decline through the 1960s. By 1969 there were only 468 farms in the county; 137 of these operated under the share system. They produced 1,000 bales of cotton, as well as large amounts of corn and hay. A small percentage of farmers produced fruit and vegetables for home consumption or local markets. Many other residents preferred to raise cattle or poultry. In 1982, nine million broilers, or meat chickens, were sold in San Augustine County (fig. 2). While poultry production provided the major source of income, herders raised cattle and produced hay to feed them. Lumber companies began the practice of reseeding cut-over acreage, and timber again became a source of supplemental income. There were a few sawmills in the county, but the business was dominated by large corporations, which usually bought rights to the trees or to the property itself.

Sabine County

Sabine County economy gradually began to recover after the Civil War. By 1900, the number of farms had increased to 1,064, and the primary crops were cotton, corn, and sweet potatoes. The population went from 3,256 in 1870 to 6,394 in 1900 to 12,299 in 1920 and the number of farms increased slightly to 1,270. Cotton bales ginned went from 2,409 in 1910 to 2,919 in 1920 to 4,760 in 1929. The county had eighteen manufacturing establishments in 1920. The number of farms continued to increase through the 1940s and then by 1950 farm values were on the decline. Crop production fluctuated and by 1950 had declined to pre-1900 lows. Cotton bales ginned fell to 1,000 by 1950. By 1969, the number of farms in the county had decreased, but their value had increased. Cotton production continued to decrease to the last reported figure of 520 bales in 1960; however manufacturing remained steady. By 1990, economy was based on tourism, livestock and broiler chicken production, and the lumber industry, and the main population centers were Hemphill, Pineland, and Bronson.

Natural Resources

Natural resources throughout the survey area include the Angelina and Attoyac Rivers along with the Angelina National Forest and Sabine National Forest. Toledo Bend Reservoir and Sam Rayburn Reservoir and Red Hills Recreation Area provide numerous recreational activities which supports the tourism industry for the survey area.

Figure 2.—Chicken houses for poultry production and coastal bermudagrass meadows for livestock grazing and hay are some of the diverse agricultural practices in the counties.

San Augustine County

In 1965, the United States Army Corps of Engineers completed Sam Rayburn Dam, thus forming Sam Rayburn Reservoir and inundating the Angelina and Attoyac Rivers. The following year Toledo Bend Reservoir was constructed on the Sabine River twenty-three miles east of San Augustine County. The survey area contained approximately 102,823 acres of fresh water, 164,119 acres of United State Forest Service, combining the Angelina National Forest and Sabine National Forest, and 3,350 acres of United States Corp of Engineers land. Recreational facilities in the woodlands and along the lakes attracted large numbers of visitors, and tourism became a new and important source of income. Operation White Tail, a 10,000-acre deer preserve, was also established.

Sabine County

During the 1930s two Civilian Conservation Corp camps, one near Pineland and one near Milam, were established to support New Deal projects in the area. The Corp helped the Texas Forest Service build fire watchtowers and roads and assisted in the planting of pine seedlings in Sabine National Forest. The Civilian Conservation Corp also helped with the construction of the Red Hills Recreation Area, another New Deal project. The Agricultural Stabilization and Conservation Service was established in Hemphill to implement crop and livestock programs to help reduce excess production. In 1938, electricity was brought to Sabine County by the Deep East Texas Electric Cooperative, which was originally funded by the Rural Electrification Agency. Construction began on Toledo Bend Reservoir in 1964. The impoundment of water began in 1966, and the electrical plant was finished in 1969. In 1967, a bridge

was built to replace the ferry. Toledo Bend is the largest man-made lake in the South; it covers 181,000 acres, over a third of which are in Sabine County.

In 1982, there were 58,744,000 cubic feet of natural gas and 36,244 barrels of oil produced in Sabine County.

In 1984, Congress set aside 9,946 acres for the Indian Mounds Wilderness Area, administered by the Yellow Pines Ranger District of the United States Forest Service, in Hemphill. The district also supervises the operation of the Red Hills, Willow Oak, and Lakeview recreation areas.

The economy was based on tourism, livestock and broiler chicken production, and the lumber industry. Sabine County offers a wide variety of recreational activities, including fishing in Sam Rayburn and Toledo Bend Reservoirs and hunting in the Angelina and Sabine National Forest.

Climate

Prepared by the Natural Resources Conservation Service National Water and Climate Center, Portland, Oregon.

San Augustine County

Climate tables were created from climate stations at San Augustine and Broaddus, Texas.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Shreveport, Louisiana.

Temperature and precipitation data for the survey area are recorded at Broaddus and San Augustine covering the period 1971 to 2000. Table 1 provides data on temperature and precipitation for the survey area as recorded at Broaddus in the period 1971 to 2000. Table 2 shows data on temperature for the survey area as recorded at San Augustine and data on precipitation for the survey area recorded at San Augustine, Bronson, and Pinedale in the period 1971 to 2000. Table 3 shows probable dates of the first freeze in fall and the last freeze in spring as recorded at Broaddus in the period 1971 to 2000. In winter, the average temperature is 45 degrees F and the average daily minimum temperature is 33 degrees at Broaddus. The lowest temperature on record, which occurred at San Augustine on January 4, 1911, is 8 degrees. In summer, the average temperature is 82 degrees and the average daily maximum temperature is 94 degrees at Broaddus. The highest temperature, which occurred at San Augustine on August 18, 1909, is 112 degrees.

Growing degree days are shown in Table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall as shown in Table 3.

The average annual total precipitation is about 52 inches at Broaddus and 54 at San Augustine. The growing season for most crops is year round in most of the county. Precipitation is distributed fairly evenly throughout the year but does drop slightly during the summer months of June, July, and August. The heaviest 1-day rainfall during the period of record was 10.6 inches at San Augustine on August 18, 1915. Thunderstorms occur on about 56 days each year, and most occur in July.

Snow and snowfall in this part of Texas is more of an oddity then a real concern. The greatest snow depth at any one time during the period of record was 2 inches recorded on January 3, 1985. The heaviest 1-day snowfall on record was 2.4 inches recorded on February 17, 1910. Both of these occurrences were in San Augustine. Broaddus has not had measurable snow since 1977.

The average relative humidity in mid-afternoon is about 58 percent. Humidity is higher at night, and the average at dawn is about 87 percent. The sun shines 73

percent of the time in summer and 52 percent in winter. The prevailing wind is from the south. Average wind speed is highest, 10 miles per hour, in March.

Sabine County

Prepared by the Natural Resources Conservation Service National Water and Climate Center, Portland, Oregon.

Climate tables are created from climate stations at San Augustine, Bronson, Pineland, and Broaddus, Texas. Bronson and Pineland do not measure temperature. San Augustine and Broaddus data is used for temperature information in Table 2.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Shreveport, Louisiana.

Temperature and precipitation data for the survey area is recorded at San Augustine, Bronson, Pineland, and Broaddus covering the period 1971 to 2000. Table 3 shows probable dates of the first freeze in fall and the last freeze in spring as recorded at Broaddus in the period 1971 to 2000.

In winter, the average temperature is 45 degrees F and the average daily minimum temperature is 33 degrees at Broaddus. The lowest temperature on record, which occurred at Bronson on February 2, 1951, is 6 degrees. In summer, the average temperature is 82 degrees and the average daily maximum temperature is 94 degrees at Broaddus. The highest temperature, which occurred at Bronson on August 9, 1947, is 114 degrees.

Growing degree days are shown in Table 2. They are equivalent to "heat units". During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 52 inches at Broaddus, 54 inches at Bronson, 55 at Pineland, and 54 at San Augustine. The growing season for most crops is year round in most of the county. Precipitation is distributed fairly evenly throughout the year but does drop slightly during the summer months of June, July, and August. The heaviest 1-day rainfall in Sabine County during the period of record was 8.57 inches at Bronson on April 9, 1968. Thunderstorms occur on about 56 days each year, and most occur in July.

Snow and snowfall in this part of Texas is more of an oddity then a real impact. The greatest snow depth at any one time during the period of record in Sabine County was 7 inches recorded on January 23, 1940. The heaviest 1-day snowfall on record was 10 inches recorded on December 21, 1929. Both of these occurrences were in Bronson.

The average relative humidity in mid-afternoon is about 58 percent. Humidity is higher at night, and the average at dawn is about 87 percent. The sun shines 73 percent of the time in summer and 52 percent in winter. The prevailing wind is from the south. Average wind speed is highest, 10 miles per hour, in March.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Moswell-Kurth-Raylake

Map Unit Composition

Percent of the survey area: 35 percent
Moswell soils—46 percent
Kurth soils—22 percent
Raylake soils—17percent
Minor soils—15 percent (Alazan, Iulus, Laneville, Lovelady, Mattex, and Rentzel soils, and Water)

Setting

Landscape: Coastal Plain
Landform: Interfluve
Parent material: Moswell and Raylake soils—clayey residuum weathered from sandstone and shale; Kurth soils—loamy residuum weathered from sandstone and shale
Slope: Moswell and Raylake soils—1 to 5 percent slopes; Kurth soils—1 to 3 percent slopes

Typical Profiles

Moswell

Surface layer: Very dark grayish brown loam
Subsurface layer: Brown loam
Subsoil: Upper part—yellowish red clay; middle part—light brownish gray clay; lower part—brown clay
Substratum layer: Upper part—light yellowish brown and brown stratified silty clay loam; lower part—brown and light brownish gray and yellowish brown stratified silty clay loam

Kurth

Surface layer: Dark grayish brown fine sandy loam
Subsurface layer: Pale brown fine sandy loam

Subsoil: Upper part—yellowish brown and brownish yellow fine sandy loam; middle part—yellowish brown, brownish yellow, light brownish gray, and gray sandy clay loam; lower part—gray clay
Substratum layer: Pale brown, light yellowish brown, and dark gray stratified sandy clay loam

Raylake

Surface layer: Dark brown clay
Subsoil: Upper part—brown clay; middle part—very dark grayish brown and dark grayish brown clay; lower part—brown clay
Substratum layer: Upper part—brown clay; lower part—yellowish brown and brown clay

Properties and Qualities

Moswell

Depth class: Deep to densic material
Drainage class: Well drained
Flooding: None
Permeability: Very slow
Shrink-swell potential: High

Kurth

Depth class: Very deep
Drainage class: Moderately well drained
Flooding: None
Permeability: Slow
Shrink-swell potential: Moderate

Raylake

Depth class: Deep to densic material
Drainage class: Somewhat poorly drained
Flooding: None
Permeability: Very slow
Shrink-swell potential: Very high

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Moswell and Raylake soils—suited; Kurth soils—well suited
Management concerns: Moswell soils—wetness, stickiness, and low strength; Kurth soils—low strength; Raylake soils—low strength and stickiness

Pastureland

Suitability: Moswell and Raylake soils—suited; Kurth soils—well suited
Management concerns: Moswell soils—erosion hazard; Raylake soils—erosion control and wetness

Urban land

Suitability: Poorly suited
Management concerns: Moswell soils—high shrink-swell potential, slow permeability, and low strength; Kurth soils—moderate shrink-swell potential, depth to bedrock,

and slow permeability; Raylake soils—very high shrink-swell potential, high clay content, very slow permeability, and low strength

2. Cuthbert-Tenaha-Bowie

Map Unit Composition

Percent of the survey area: 17 percent
Cuthbert soils—35 percent
Tenaha soils—34 percent
Bowie soils—13 percent
Minor soils—18 percent (Darco and Mattex soils, and Water)

Setting

Landscape: Coastal Plain
Landform: Interfluve
Parent material: Cuthbert soils—clayey residuum weathered from sandstone and shale; Tenaha and Bowie soils—loamy residuum weathered from sandstone and shale
Slope: Cuthbert and Tenaha soils—5 to 15 percent slopes; Bowie soils—1 to 5 percent slopes

Typical Profiles

Cuthbert

Surface layer: Dark grayish brown fine sandy loam
Subsurface layer: Yellowish brown fine sandy loam
Subsoil: Upper part—yellowish red clay; lower part—light gray clay
Substratum layer: Light reddish brown stratified clay

Tenaha

Surface layer: Dark brown loamy fine sand
Subsurface layer: Yellowish brown loamy fine sand
Subsoil: Upper part—dark yellowish brown sandy clay loam; middle part—strong brown sandy clay loam; lower part—red and strong brown sandy loam
Substratum layer: Red and reddish yellow sandy loam

Bowie

Surface layer: Brown fine sandy loam
Subsurface layer: Light yellowish brown fine sandy loam
Subsoil: Upper part—brownish yellow sandy clay loam; lower part—yellowish brown sandy clay loam

Properties and Qualities

Cuthbert

Depth class: Moderately deep to densic material
Drainage class: Well drained
Flooding: None
Permeability: Slow
Shrink-swell potential: Moderate

Tenaha

Depth class: Deep to densic material
Drainage class: Well drained
Flooding: None

Permeability: Moderately slow
Shrink-swell potential: Low

Bowie

Depth class: Very deep
Drainage class: Well drained
Flooding: None
Permeability: Moderately slow
Shrink-swell potential: Low

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Cuthbert soils—suited; Tenaha and Bowie soils—well suited
Management concerns: Cuthbert soils—erosion hazard, slope, rock fragments on the surface, and stickiness; Tenaha soils—low strength and sandy surfaces; Bowie soils—low strength

Pastureland

Suitability: Cuthbert and Tenaha soils—poorly suited; Bowie soils—well suited
Management concerns: Cuthbert soils—hazard of erosion, low available water capacity, moderately deep rooting depth; Tenaha soils—hazard of erosion and low available water capacity; Bowie soils—erosion control during renovation

Urban land

Suitability: Cuthbert and Tenaha soils—poorly suited; Bowie soils—suited
Management concerns: Cuthbert soils—moderate shrink-swell potential, slope, clayey nature of the subsoil, and low strength; Tenaha soils—shallow excavations may cave, slow permeability, and low strength; Bowie soils—seasonal high water table and low strength

3. Mattex-Laneville

Map Unit Composition

Percent of the survey area: 11 percent
Mattex soils—37 percent
Laneville soils—31 percent
Minor soils—32 percent (Cuthbert, Kurth, Metcalf, Moswell, Sawtown, and Tenaha soils)

Setting

Landscape: Coastal plain
Landform: Flood plains
Parent material: Loamy alluvium
Slope: 0 to 1 percent slopes

Typical Profiles

Mattex

Surface layer: Brown clay loam
Subsoil: Upper part—dark yellowish brown clay loam; middle part—gray clay loam; lower part—greenish gray clay

Laneville

Surface layer: Brown loam
Subsoil: Upper part—yellowish brown, grayish brown, and dark yellowish brown loam and silt loam; lower part—grayish brown clay loam and clay

Properties and Qualities

Mattex

Depth class: Very deep
Drainage class: Somewhat poorly drained
Flooding: Frequent
Permeability: Slow
Shrink-swell potential: Moderate

Laneville

Depth class: Very deep
Drainage class: Moderately well drained
Flooding: Frequent
Permeability: Moderate
Shrink-swell potential: High

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Mattex soils—well suited; Laneville soils—suited
Management concerns: Mattex soils—low strength, wetness, and hazard of flooding; Laneville soils—hazard of flooding and low strength

Pastureland

Suitability: Suited
Management concerns: Mattex soils—hazard of flooding and wetness; Laneville soils—hazard of flooding

Urban land

Suitability: Not suited
Management concerns: Mattex soils—frequent flooding, clayey nature of the soil, moderate shrink-swell potential, and low strength; Laneville soils—frequent flooding, high shrink-swell potential, and seasonal high water table

4. Nacogdoches-Trawick-Alto

Map Unit Composition

Percent of the survey area: 11 percent
Nacogdoches soils—39 percent
Trawick soils—29 percent
Alto soils—16 percent
Minor soils—16 percent (Attoyac, Hannahatchee, Laneville, Mattex, and Tenaha soils, Mine or Quarry miscellaneous unit, and Water)

Setting

Landscape: Coastal Plain

Landform: Nacogdoches and Trawick soils—interfluve; Alto soils—saddle on interfluve
Parent material: Nacogdoches and Trawick soils—clayey residuum weathered from glauconitic sandstone; Alto soils—loamy residuum weathered from glauconitic sandstone
Slope: Nacogdoches soils—1 to 5 percent slopes; Trawick soils—5 to 15 percent slopes; Alto soils—1 to 3 percent slopes

Typical Profiles

Nacogdoches

Surface layer: Dark reddish brown clay loam
Subsoil: Dark red clay

Trawick

Surface layer: Dark brown gravelly clay loam
Subsoil: Upper part—dark red clay; lower part—red clay loam
Substratum layer: Strong brown glauconitic materials

Alto

Surface layer: Dark reddish brown clay loam
Subsoil: Dark yellowish brown clay loam
Substratum layer: Dark yellowish brown clay

Properties and Qualities

Nacogdoches

Depth class: Very deep
Drainage class: Well drained
Flooding: None
Permeability: Moderately slow
Shrink-swell potential: Moderate

Trawick

Depth class: Moderately deep to paralithic bedrock
Drainage class: Well drained
Flooding: None
Permeability: Moderately slow
Shrink-swell potential: Moderate

Alto

Depth class: Very deep
Drainage class: Moderately well drained
Flooding: None
Permeability: Moderately slow
Shrink-swell potential: Moderate

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Nacogdoches soils—poorly suited; Trawick and Alto soils—suited
Management concerns: Nacogdoches soils—low strength, rock fragments on the surface, and stickiness; Trawick soils—hazard of erosion, low strength, slope,

and rock fragments on the surface; Alto soils—low strength, rock fragments on the surface, and stickiness

Pastureland

Suitability: Nacogdoches soils—suited; Trawick—poorly suited; Alto soils—well suited
Management concerns: Nacogdoches soils—erosion control; Tenaha soils—erosion control and low available water capacity

Urban land

Suitability: Nacogdoches and Alto soils—suited; Trawick soils—poorly suited
Management concerns: Nacogdoches soils—moderate shrink-swell potential, clayey nature of the subsoil, slow permeability, and low strength; Trawick soils—moderate shrink-swell potential, slope, clayey nature of the soil, moderately slow permeability, and low strength; Alto soils—moderate shrink-swell potential, seasonal high water table, moderately slow permeability, and low strength

5. Eastwood-Latex-Sawlit

Map Unit Composition

Percent of the survey area: 10 percent
Eastwood soils—45 percent
Latex soils—25 percent
Sawlit soils—20 percent
Minor soils—10 percent (Laneville, Mattex, and Tenaha soils)

Setting

Landscape: Coastal Plain
Landform: Eastwood soils—interfluve; Latex soils—mound on interfluve; Sawlit soils—microlow on stream terrace
Parent material: Eastwood soils—clayey residuum weathered from sandstone and shale; Latex soils—loamy alluvium over clayey residuum weathered from sandstone and shale; Sawlit soils—loamy alluvium
Slope: Eastwood and Latex soils—1 to 3 percent slopes; Sawlit soils—0 to 3 percent

Typical Profiles

Eastwood

Surface layer: Brown very fine sandy loam
Subsoil: Upper part—red clay; lower part—light yellowish brown clay loam
Substratum layer: Light yellowish brown, light brownish gray, and brownish yellow silty clay loam

Latex

Surface layer: Brown fine sandy loam
Subsurface layer: Light yellowish brown fine sandy loam
Subsoil: Upper part—yellowish brown loam and strong brown sandy clay loam; middle part—yellowish brown, red, and pale brown clay loam; lower part—strong brown and light brownish gray and red clay

Sawlit

Surface layer: Dark grayish brown fine sandy loam
Subsurface layer: Light yellowish brown fine sandy loam

Subsoil: Upper part—reddish yellow, light brownish gray, light yellowish brown, and grayish brown sandy clay loam; middle part—light brownish gray, light gray, and gray clay loam; lower part—gray and light gray clay

Properties and Qualities

Eastwood

Depth class: Deep to densic material
Drainage class: Well drained
Flooding: None
Permeability: Very slow
Shrink-swell potential: High

Latex

Depth class: Very deep
Drainage class: Moderately well drained
Flooding: None
Permeability: Moderate
Shrink-swell potential: High

Sawlit

Depth class: Very deep
Drainage class: Moderately well drained
Flooding: None
Permeability: Moderate
Shrink-swell potential: Moderate

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Well suited
Management concerns: Eastwood soils—low strength and stickiness; Latex and Sawlit soils—low strength

Pastureland

Suitability: Eastwood soils—suited; Latex and Sawlit soils—well suited
Management concerns: Eastwood soils—erosion control

Urban land

Suitability: Eastwood and Sawlit soils—poorly suited; Latex soils—suited
Management concerns: Eastwood soils—severe shrink-swell potential, clayey nature of the soil, very slow permeability, and low strength; Latex soils—moderate shrink-swell potential, seasonal high water table, clayey nature of the soil, and low strength; Sawlit soils—seasonal high water table, moderate shrink-swell potential, clayey nature of the soil, and low strength

6. Cuthbert-Kirvin-Bowie

Map Unit Composition

Percent of the survey area: 7 percent
Cuthbert soils—32 percent

Kirvin soils—28 percent
Bowie soils—19 percent
Minor soils—21 percent (Iulus, Mattex, Sacul, and Tenaha soils, and Water)

Setting

Landscape: Coastal Plain
Landform: Cuthbert and Bowie soils—interfluve; Kirvin soils—ridge
Parent material: Cuthbert and Kirvin soils—clayey residuum weathered from sandstone and shale; Bowie soils—loamy residuum weathered from sandstone and shale
Slope: Cuthbert soils—5 to 15 percent slopes; Kirvin and Bowie soils—1 to 5 percent slopes

Typical Profiles

Cuthbert

Surface layer: Dark grayish brown fine sandy loam
Subsurface layer: Yellowish brown fine sandy loam
Subsoil: Upper part—yellowish red clay; lower part—light gray clay
Substratum layer: Light reddish brown stratified clay

Kirvin

Surface layer: Dark grayish brown fine sandy loam
Subsurface layer: Grayish brown fine sandy loam
Subsoil: Upper part—yellowish red clay; middle part—red clay; lower part—light gray, red, and reddish yellow clay
Substratum layer: Upper part—red, strong brown, and light gray sandy clay loam; lower part—strong brown sandy clay loam

Bowie

Surface layer: Brown fine sandy loam
Subsurface layer: Light yellowish brown fine sandy loam
Subsoil: Upper part—brownish yellow sandy clay loam; lower part—yellowish brown sandy clay loam

Properties and Qualities

Cuthbert

Depth class: Moderately deep to densic material
Drainage class: Well drained
Flooding: None
Permeability: Slow
Shrink-swell potential: Moderate

Kirvin

Depth class: Deep to densic material
Drainage class: Well drained
Flooding: None
Permeability: Moderately slow
Shrink-swell potential: Moderate

Bowie

Depth class: Very deep
Drainage class: Well drained
Flooding: None

Permeability: Moderately slow
Shrink-swell potential: Low

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Cuthbert and Kirvin soils—suited; Bowie soils—well suited
Management concerns: Cuthbert soils—erosion hazard, slope, rock fragments on the surface, and stickiness; Kirvin soils—low strength and stickiness; Bowie soils—low strength

Pastureland

Suitability: Cuthbert soils—poorly suited; Kirvin and Bowie soils—well suited
Management concerns: Cuthbert soils—hazard of erosion, low available water capacity, moderately deep rooting depth; Kirvin and Bowie soils—erosion control during renovation

Urban land

Suitability: Cuthbert soils—poorly suited; Kirvin and Bowie soils—suited
Management concerns: Cuthbert soils—moderate shrink-swell potential, slope, clayey nature of the subsoil, and low strength; Kirvin soils—moderate shrink-swell potential, clayey nature of the soil, and low strength; Bowie soils—seasonal high water table and low strength

7. Eastwood-Metcalf-Sawtown

Map Unit Composition

Percent of the survey area: 5 percent
Eastwood soils—64 percent
Metcalf soils—13 percent
Sawtown soils—11 percent
Minor soils—12 percent (Laneville, Mattex, and Tenaha soils, and Water)

Setting

Landscape: Coastal Plain
Landform: Eastwood soils—interfluve; Metcalf soils—stream terrace; Sawtown—mound on stream terrace
Parent material: Eastwood soils—clayey residuum weathered from sandstone and shale; Metcalf and Sawtown soils—loamy alluvium over clayey residuum weathered from sandstone and shale
Slope: Eastwood soils—1 to 3 percent slopes; Metcalf and Sawtown soils—0 to 2 percent slopes

Typical Profiles

Eastwood

Surface layer: Brown very fine sandy loam
Subsoil: Upper part—red clay; lower part—light yellowish brown clay loam
Substratum layer: Light yellowish brown, light brownish gray, and brownish yellow silty clay loam

Metcalf

Surface layer: Dark grayish brown very fine sandy loam
Subsurface layer: Pale brown and brownish yellow loam
Subsoil: Upper part—brownish yellow loam; middle part—pale brown loam; lower part—red, gray, and yellowish brown clay

Sawtown

Surface layer: Brown very fine sandy loam
Subsurface layer: Pale brown very fine sandy loam
Subsoil: Upper part—yellowish brown loam; middle part—brownish yellow loam; lower part—gray clay loam

Properties and Qualities

Eastwood

Depth class: Deep to densic material
Drainage class: Well drained
Flooding: None
Permeability: Very slow
Shrink-swell potential: High

Metcalf

Depth class: Very deep
Drainage class: Somewhat poorly drained
Flooding: None
Permeability: Impermeable
Shrink-swell potential: High

Sawtown

Depth class: Very deep
Drainage class: Well drained
Flooding: None
Permeability: Very slow
Shrink-swell potential: Moderate

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Well suited
Management concerns: Eastwood soils—low strength and stickiness; Metcalf soils—low strength; Sawtown soils—low strength

Pastureland

Suitability: Eastwood and Metcalf soils—suited; Sawtown soils—well suited
Management concerns: Eastwood soils—erosion control during renovation; Metcalf soils—wetness

Urban land

Suitability: Poorly suited
Management concerns: Eastwood soils—severe shrink-swell potential, clayey nature of the soil, very slow permeability, and low strength; Metcalf soils—seasonal high

water table, severe shrink-swell potential, clayey nature of the soil, impermeable permeability, and low strength; Sawtown soils—moderate shrink-swell potential, seasonal high water table, very slow permeability, and low strength

8. Kisatchie-Letney-Tehran

Map Unit Composition

Percent of the survey area: 2 percent
Kisatchie soils—32 percent
Letney soils—25 percent
Tehran soils—24 percent
Minor soils—19 percent (Iulus, Mattex, and Sawlit soils, Mine or Quarry miscellaneous unit, and Water)

Setting

Landscape: Coastal Plain
Landform: Interfluve
Parent material: Kisatchie soils—clayey residuum weathered from siltstone; Letney soils—sandy and loamy marine deposits; Tehran soils—loamy residuum weathered from sandstone and shale
Slope: Kisatchie and Tehran soils—5 to 15 percent slopes; Letney soils—1 to 5 percent slopes

Typical Profiles

Kisatchie

Surface layer: Dark grayish brown loam
Subsurface layer: Brown loam
Subsoil: Upper part—grayish brown clay; lower part—grayish brown and pale brown clay
Substratum layer: Upper part—light brownish gray and light yellowish brown mudstone bedrock; lower part—light yellowish brown mudstone bedrock

Letney

Surface layer: Brown loamy sand
Subsurface layer: Pale brown loamy sand
Subsoil: Upper part—brownish yellow sandy clay loam; lower part—red sandy clay loam

Tehran

Surface layer: Brown loamy sand
Subsurface layer: Upper part—dark yellowish brown loamy sand; middle part—yellowish brown loamy sand; lower part—pale brown loamy sand
Subsoil: Strong brown sandy loam

Properties and Qualities

Kisatchie

Depth class: Moderately deep to paralithic bedrock
Drainage class: Well drained
Flooding: None
Permeability: Very slow
Shrink-swell potential: High

Letney

Depth class: Very deep
Drainage class: Well drained
Flooding: None
Permeability: Moderately rapid
Shrink-swell potential: Low

Tehran

Depth class: Very deep
Drainage class: Somewhat excessively drained
Flooding: None
Permeability: Moderately rapid
Shrink-swell potential: Low

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Kisatchie soils—poorly suited; Letney and Tehran soils—suited
Management concerns: Kisatchie soils—slope, hazard of erosion, stickiness, and low strength; Letney soils—low strength and sandy nature of the soil; Tehran soils—slope, hazard of erosion, sandy nature of the soil, and low strength

Pastureland

Suitability: Kisatchie and Tehran soils—poorly suited; Letney soils—suited
Management concerns: Kisatchie soils—erosion control and low available water capacity; Letney soils—erosion control; Tehran soils—erosion control and low available water capacity

Urban land

Suitability: Kisatchie and Tehran soils—poorly suited; Letney soils—suited
Management concerns: Kisatchie soils—high shrink-swell potential, very slow permeability, clayey nature of the soil, slope, and low strength; Letney soils—shallow excavations may cave in and moderately rapid permeability; Tehran soils—slope and moderately rapid permeability

9. Gallime-Alazan-Attoyac

Map Unit Composition

Percent of the survey area: 2 percent
Gallime soils—42 percent
Alazan soils—16 percent
Attoyac soils—15 percent
Minor soils—27 percent (Laneville, Maben, Mattex, Mollville, and Tenaha soils, and Water)

Setting

Landscape: Coastal Plain
Landform: Gallime soils—mound on stream terrace; Alazan and Attoyac soils—stream terrace
Parent material: Loamy alluvium

Slope: Gallime soils—1 to 3 percent slopes; Alazan soils—0 to 2 percent slopes; Attoyac soils—1 to 4 percent slopes

Typical Profiles

Gallime

Surface layer: Brown very fine sandy loam
Subsurface layer: Upper part—yellowish brown very fine sandy loam; lower part—light yellowish brown very fine sandy loam
Subsoil: Upper part—yellowish red sandy clay loam; middle part—yellowish red and strong brown sandy clay loam; lower part—yellowish brown and yellowish red sandy clay loam

Alazan

Surface layer: Brown fine sandy loam
Subsurface layer: Yellowish brown fine sandy loam
Subsoil: Upper part—brownish yellow loam; middle part—yellowish brown and brownish yellow clay loam; lower part—light brownish gray clay loam

Attoyac

Surface layer: Brown fine sandy loam
Subsurface layer: Yellowish brown fine sandy loam
Subsoil: Upper part—red fine sandy loam; lower part—red sandy clay loam

Properties and Qualities

Gallime

Depth class: Very deep
Drainage class: Well drained
Flooding: None
Permeability: Moderate
Shrink-swell potential: Low

Alazan

Depth class: Very deep
Drainage class: Moderately well drained
Flooding: None
Permeability: Moderate
Shrink-swell potential: Low

Attoyac

Depth class: Very deep
Drainage class: Well drained
Flooding: None
Permeability: Moderate
Shrink-swell potential: Low

Land Use

Dominant use: Woodland
Other uses: Pasture and hayland

Woodland

Suitability: Well suited
Management concerns: Low strength

Pastureland

Suitability: Well suited
Management concerns: None

Urban land

Suitability: Gallime and Alazan soils—suited; Attoyac soils—well suited
Management concerns: Gallime and Alazan soils—seasonal high water table and low strength; Attoyac soils—low strength

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. Some of the map unit depths are not the same depths as in the Taxonomic Unit section, for that particular series. The depths do not impact soil interpretations. A different pedon was used for the map unit, while another pedon was used for the taxonomic unit. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a soil series. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis

of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Cuthbert fine sandy loam, 5 to 15 percent slopes is a phase of the Cuthbert series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Mollville-Besner complex, 0 to 2 percent slopes, mounded, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. MiQ—Mine or quarry, is an example.

Table 4 lists the map units in this survey area. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The "Glossary" defines many of the terms used in describing the soils.

AaB—Alazan fine sandy loam, 0 to 2 percent slopes

Map Unit Composition

Major components:
Alazan and similar soils: 90 percent

Contrasting inclusions:
Gallime soils: 5 percent
Mollville soils: 5 percent

Component Descriptions

Alazan

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: High (about 9.3 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 18 to 30 inches, apparent; from January to April, and May to December
Runoff class: Very low
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 3 inches; brown fine sandy loam; strongly acid

Subsurface layer
3 to 12 inches; yellowish brown fine sandy loam; very strongly acid

Subsoil

12 to 20 inches; brownish yellow loam, with yellowish brown masses of oxidized iron; very strongly acid

20 to 26 inches; yellowish brown clay loam, with yellowish red masses of oxidized iron and light brownish gray clay depletions; very strongly acid

26 to 36 inches; yellowish brown clay loam, with yellowish red and red masses of oxidized iron, and light brownish gray clay depletions; very strongly acid

36 to 47 inches; brownish yellow clay loam, with strong brown, yellowish red, and red masses of oxidized iron, and light brownish gray clay depletions; very strongly acid

47 to 52 inches; yellowish brown clay loam, with strong brown and yellowish red masses of oxidized iron, and light brownish gray clay depletions; very strongly acid

52 to 60 inches; yellowish brown clay loam, with strong brown and yellowish brown masses of oxidized iron, and light brownish gray clay depletions; very strongly acid

60 to 75 inches; yellowish brown clay loam, with dark reddish brown, yellowish red, and dark yellowish brown masses of oxidized iron, and light brownish gray clay depletions; very strongly acid

75 to 80 inches; light brownish gray clay loam, with yellowish red and yellowish brown masses of oxidized iron, and light brownish gray clay depletions; very strongly acid

Use and Management

Cropland

- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- These soils are well suited to pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites

- This soil is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

AbA—Alazan-Besner complex, 0 to 2 percent slopes

Map Unit Composition

Major components:
Alazan and similar soils: 45 percent
Besner and similar soils: 40 percent

Contrasting inclusions:
Gallime soils: 10 percent
Mollville soils: 5 percent

Component Descriptions

Alazan

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.9 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 18 to 30 inches, apparent; from January to May, and June to December
Runoff class: Low
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 5 inches; brown very fine sandy loam; moderately acid

Subsurface layer
5 to 11 inches; pale brown very fine sandy loam; moderately acid

Subsoil
11 to 20 inches; yellowish brown loam; strongly acid
20 to 37 inches; strong brown sandy clay loam; strongly acid
37 to 46 inches; sandy clay loam; strongly acid
46 to 80 inches; sandy clay loam; strongly acid

Besner

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Mounds on stream terraces
Geomorphic positions, three-dimensional: Tread

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.7 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 48 to 72 inches, apparent; from January to February, and March to December
Runoff class: Low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 7 inches; brown fine sandy loam; moderately acid

Subsurface layer
7 to 24 inches; light yellowish brown fine sandy loam, with brownish yellow masses of oxidized iron; moderately acid

Subsoil
24 to 39 inches; yellowish brown loam, with pale brown iron depletions; strongly acid
39 to 53 inches; brownish yellow loam, with strong brown masses of oxidized iron; strongly acid
53 to 80 inches; yellowish brown sandy clay loam, with brownish yellow masses of oxidized iron; strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- This soil is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance.

Septic tank absorption fields
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

AtA—Alto clay loam, 1 to 3 percent slopes

Map Unit Composition

Major components:
Alto and similar soils: 85 percent

Contrasting inclusions:
Nacogdoches soils: 10 percent
Other soils: 5 percent

Component Descriptions

Alto

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Saddles on interfluves
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy residuum weathered from glauconitic sandstone
Slope: 1 to 3 percent
Depth to restrictive feature: 50 to 70 inches to densic material
Drainage class: Moderately well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: High (about 9.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 30 to 48 inches, perched; from January to March, and April to December
Runoff class: Very low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 7 inches; dark reddish brown clay loam; moderately acid

Subsoil
7 to 17 inches; dark yellowish brown clay loam; strongly acid
17 to 26 inches; dark yellowish brown clay loam; strongly acid
26 to 41 inches; dark yellowish brown clay loam; strongly acid
41 to 58 inches; dark yellowish brown clay loam; moderately acid

Substratum layer
58 to 80 inches; dark yellowish brown clay; moderately acid

Use and Management

Cropland

- All areas are prime farmland.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- These soils are well suited to pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

AtB—Attoyac fine sandy loam, 0 to 4 percent slopes

Map Unit Composition

Major components:
Attoyac and similar soils: 85 percent

Contrasting inclusions:
Alazan soils: 5 percent
Austonio soils: 5 percent
Metcalf soils: 5 percent

Component Descriptions

Attoyac

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 4 percent

Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: High (about 9.4 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 5 inches; brown fine sandy loam; strongly acid

Subsurface layer
5 to 10 inches; yellowish brown fine sandy loam; very strongly acid

Subsoil
10 to 28 inches; red fine sandy loam; very strongly acid
28 to 48 inches; red sandy clay loam; very strongly acid
48 to 62 inches; red sandy clay loam; very strongly acid
62 to 80 inches; red sandy clay loam; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- These soils are well suited to use as building sites.

Septic tank absorption fields
- These soils are well suited to use as a site for septic tank absorption fields.

Local roads and streets
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

AuD—Austonio fine sandy loam, 5 to 12 percent slopes

Map Unit Composition

Major components:
Austonio and similar soils: 80 percent

Contrasting inclusions:
Eastwood soils: 20 percent

Component Descriptions

Austonio

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 5 to 12 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: High (about 9.3 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 48 to 72 inches, perched
Runoff class: Medium
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 8 inches; brown fine sandy loam; extremely acid

Subsurface layer
8 to 16 inches; pale brown fine sandy loam; moderately acid

Subsoil
16 to 27 inches; yellowish brown sandy clay loam; extremely acid
27 to 41 inches; yellowish brown sandy clay loam; extremely acid
41 to 53 inches; yellowish brown sandy clay loam; extremely acid
53 to 70 inches; brownish yellow sandy clay loam; extremely acid

Substratum layer
70 to 80 inches; brownish yellow and light brownish gray fine sandy loam; very strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields

- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.
- The seasonal high water table in areas of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

BaB—Bernaldo fine sandy loam, 0 to 3 percent slopes

Map Unit Composition

Major components:
Bernaldo and similar soils: 90 percent

Contrasting inclusions:
Alazan soils: 5 percent
Mollville soils: 5 percent

Component Descriptions

Bernaldo

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 3 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: High (about 9.3 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 48 to 72 inches, perched; from January to March, and December
Runoff class: Very low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 5 inches; brown fine sandy loam; moderately acid

Subsurface layer
5 to 15 inches; light yellowish brown fine sandy loam; moderately acid

Subsoil
15 to 27 inches; yellowish brown clay loam, with red masses of oxidized iron; strongly acid
27 to 41 inches; yellowish brown sandy clay loam, with yellowish brown, reddish brown, and strong brown masses of oxidized iron, and light yellowish brown clay depletions; strongly acid
41 to 54 inches; yellowish brown sandy clay loam, with yellowish red and yellowish brown masses of oxidized iron, and light brownish gray clay depletions; strongly acid
54 to 80 inches; yellowish brown and light yellowish brown sandy clay loam, with light brownish gray clay depletions; strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- These soils are well suited to cropland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields
- The seasonal high water table in areas of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

BeA—Besner fine sandy loam, 0 to 3 percent slopes

Map Unit Composition

Major components:
Besner and similar soils: 85 percent

Contrasting inclusions:
Gallime soils: 10 percent
Mollville soils: 5 percent

Component Descriptions

Besner

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 3 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.7 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 48 to 72 inches, apparent; from January to February
Runoff class: Low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 6 inches; dark brown fine sandy loam; very strongly acid

Subsurface layer
6 to 15 inches; brown fine sandy loam; moderately acid
15 to 25 inches; pale brown fine sandy loam; moderately acid
25 to 40 inches; pale brown and brownish yellow fine sandy loam; moderately acid
40 to 55 inches; very pale brown and brownish yellow fine sandy loam; strongly acid

Subsoil
55 to 62 inches; yellowish brown loam, with yellowish red masses of oxidized iron; strongly acid
62 to 80 inches; red, grayish red, and brownish yellow sandy clay loam; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development

and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields

- The seasonal high water table in areas of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- These soils are well suited to use as a site for local roads and streets.

BfA—Betis loamy fine sand, 0 to 8 percent slopes

Map Unit Composition

Major components:
Betis and similar soils: 95 percent

Contrasting inclusions:
Kawah soils: 5 percent

Component Descriptions

Betis

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy residuum weathered from sandstone and shale
Slope: 0 to 8 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat excessively drained
Slowest soil permeability: Rapid (about 6.0 in/hr)
Available water capacity: Low (about 5.4 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very low
Non-irrigated land capability: 3s

Typical Profile

Surface layer
0 to 7 inches; brown loamy fine sand; strongly acid

Subsoil
7 to 28 inches; light brown loamy fine sand; very strongly acid
28 to 43 inches; light yellowish brown loamy fine sand; very strongly acid
43 to 55 inches; yellowish brown loamy fine sand; very strongly acid
55 to 80 inches; light yellowish brown loamy fine sand; very strongly acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers increase the maintenance of haul roads and log landings, and reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites

- These soils are well suited to use as building sites.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- These soils are well suited to use as a site for local roads and streets.

BoC—Bowie fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Bowie and similar soils: 80 percent

Contrasting inclusions:
Kirvin soils: 10 percent
Lilbert soils: 10 percent

Component Descriptions

Bowie

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains

Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 7.8 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 42 to 60 inches, perched; from January to April
Runoff class: Low
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 9 inches; brown fine sandy loam; slightly acid

Subsurface layer
9 to 17 inches; light yellowish brown fine sandy loam; moderately acid

Subsoil
17 to 25 inches; brownish yellow sandy clay loam; strongly acid
25 to 41 inches; yellowish brown sandy clay loam; strongly acid
41 to 80 inches; yellowish brown sandy clay loam, with light brownish gray clay depletions; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- The seasonal high water table may restrict the period when excavations can be made, and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

BuB—Bub clay loam, 2 to 5 percent slopes

Map Unit Composition

Major components:
Bub and similar soils: 80 percent

Contrasting inclusions:
Trawick soils: 15 percent
Alto soils: 5 percent

Component Descriptions

Bub

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from glauconitic sandstone
Slope: 2 to 5 percent
Depth to restrictive feature: 12 to 20 inches to paralithic bedrock
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Very low (about 1.5 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: High
Non-irrigated land capability: 7s

Typical Profile

Surface layer
0 to 4 inches; dark reddish brown clay loam; moderately acid

Subsoil
4 to 12 inches; reddish brown clay; strongly acid
12 to 18 inches; yellowish red sandy clay; strongly acid

Substratum layer
18 to 80 inches; dark greenish gray, strong brown, light gray, and yellowish brown sandy clay; slightly acid

Use and Management

Cropland

- These soils are not suited to cropland.

Pastureland

- These soils are not recommended for pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

ChA—Chireno clay loam, 0 to 2 percent slopes

Map Unit Composition

Major components:
Chireno and similar soils: 95 percent

Contrasting inclusions:
Alto soils: 5 percent

Component Descriptions

Chireno

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 8.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: About 42 to 60 inches, apparent; from January to April
Runoff class: Very low
Non-irrigated land capability: 2s

Typical Profile

Surface layer
0 to 3 inches; dark brown clay loam; slightly acid

Subsurface layer
3 to 7 inches; very dark grayish brown clay loam; slightly acid

Subsoil
7 to 16 inches; very dark gray clay, with strong brown masses of oxidized iron; moderately acid
16 to 33 inches; very dark gray and dark yellowish brown clay, with yellowish red masses of oxidized iron; moderately acid
33 to 50 inches; strong brown and very dark gray clay, with yellowish red masses of oxidized iron; moderately acid
50 to 80 inches; reddish yellow and very dark gray clay, with yellowish red masses of oxidized iron; slightly acid

Use and Management

Cropland
- All areas are prime farmland.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

CoB—Corrigan fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Corrigan and similar soils: 85 percent

Contrasting inclusions:
Rayburn soils: 10 percent
Other soils: 5 percent

Component Descriptions

Corrigan

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from mudstone
Slope: 1 to 5 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Low (about 4.5 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: About 12 to 30 inches, perched; from January to March, and December
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 6 inches; dark grayish brown fine sandy loam; strongly acid

Subsurface layer
6 to 14 inches; light yellowish brown fine sandy loam; strongly acid

Subsoil
14 to 23 inches; grayish brown clay; very strongly acid
23 to 31 inches; grayish brown clay; extremely acid
31 to 39 inches; light brownish gray clay, with olive brown mottles and brownish yellow masses of oxidized iron; extremely acid

Substratum layer
39 to 80 inches; light brownish gray stratified silty clay loam; extremely acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted.
- Subsurface drainage helps to lower the seasonal high water table.

- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

CrG—Cuthbert soils, 5 to 15 percent slopes, graded

Map Unit Composition

Major components:
Cuthbert and similar soils: 75 percent

Contrasting inclusions:
Tenaha soils: 20 percent
Smithdale soils: 5 percent

Component Descriptions

Cuthbert

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Surface fragments: About 0.00 to 0.01 percent subrounded cobbles
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 7.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 2 inches; brown gravelly clay loam; very strongly acid

Subsoil
2 to 6 inches; yellowish red clay; very strongly acid
6 to 22 inches; yellowish red and light brownish gray clay; very strongly acid

Substratum layer
22 to 30 inches; light brownish gray weathered bedrock; very strongly acid
30 to 80 inches; light brownish gray, gray, dark red, and brown weathered bedrock; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.
- The rooting depth of plants may be restricted by a dense soil layer.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, increases the cost of constructing haul roads and log landings, harvesting equipment may be difficult to operate and damage may result, and creates unsafe conditions for log trucks.

- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

CtE—Cuthbert fine sandy loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Cuthbert and similar soils: 75 percent

Contrasting inclusions:
Tenaha soils: 15 percent
Iulus soils: 5 percent
Sacul soils: 5 percent

Component Descriptions

Cuthbert

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.6 in/hr)
Available water capacity: Moderate (about 7.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 6 inches; dark grayish brown fine sandy loam; moderately acid

Subsurface layer
6 to 10 inches; yellowish brown fine sandy loam; strongly acid

Subsoil
10 to 21 inches; yellowish red clay; very strongly acid
21 to 31 inches; yellowish red clay; very strongly acid
31 to 37 inches; light gray clay; extremely acid

Substratum layer
37 to 80 inches; light reddish brown stratified clay; extremely acid

Use and Management

Cropland

- These soils are not suited to cropland.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.
- The rooting depth of plants may be restricted by a dense soil layer.

Woodland

- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

CtG—Cuthbert fine sandy loam, 15 to 35 percent slopes

Map Unit Composition

Major components:
Cuthbert and similar soils: 85 percent

Contrasting inclusions:
Tenaha soils: 15 percent

Component Descriptions

Cuthbert

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 7.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: High
Non-irrigated land capability: 7e

Typical Profile

Surface layer
0 to 5 inches; brown fine sandy loam; very strongly acid

Subsurface layer
5 to 10 inches; yellowish brown fine sandy loam; very strongly acid

Subsoil
10 to 19 inches; reddish yellow clay; very strongly acid
19 to 28 inches; yellowish red clay; very strongly acid
28 to 33 inches; yellowish red clay; very strongly acid

Substratum layer
33 to 80 inches; reddish yellow fine sandy loam; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland
- These soils are not recommended for pasture.
- The rooting depth of plants may be restricted by a dense soil layer.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

CtS—Cuthbert gravelly fine sandy loam, 15 to 35 percent slopes, stony

Map Unit Composition

Major components:
Cuthbert and similar soils: 85 percent

Contrasting inclusions:
Tenaha soils: 15 percent

Component Descriptions

Cuthbert

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.6 in/hr)
Available water capacity: Moderate (about 7.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 7s

Typical Profile

Surface layer
0 to 3 inches; dark brown gravelly fine sandy loam; strongly acid

Subsoil
3 to 14 inches; red clay; very strongly acid
14 to 24 inches; red clay; very strongly acid
24 to 30 inches; red clay; very strongly acid

Substratum layer
30 to 80 inches; light brownish gray and yellowish red stratified clay; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland
- These soils are generally not recommended for pasture.
- The rooting depth of plants may be restricted by a dense soil layer.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

CuE—Cuthbert gravelly fine sandy loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Cuthbert and similar soils: 90 percent

Contrasting inclusions:
Tenaha soils: 10 percent

Component Descriptions

Cuthbert

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Low (about 4.5 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 3 inches; brown gravelly fine sandy loam; very strongly acid

Subsurface layer
3 to 6 inches; yellowish red gravelly fine sandy loam; very strongly acid

Subsoil
6 to 15 inches; red clay; very strongly acid
15 to 24 inches; red clay; very strongly acid
24 to 31 inches; dark red, light brownish gray, brownish yellow, and red clay; very strongly acid

Substratum layer
31 to 37 inches; light brownish gray and dark red clay loam; very strongly acid
37 to 80 inches; dark red and light brownish gray weathered bedrock; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.
- The rooting depth of plants may be restricted by a dense soil layer.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions, reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

DaC—Darco loamy fine sand, 1 to 8 percent slopes

Map Unit Composition

Major components:
Darco and similar soils: 80 percent

Contrasting inclusions:
Tenaha soils: 10 percent
Rentzel soils: 5 percent
Cuthbert soils: 5 percent

Component Descriptions

Darco

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Broad interstream divides
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 1 to 8 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat excessively drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Low (about 4.8 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 3s

Typical Profile

Surface layer
0 to 9 inches; brown loamy fine sand; strongly acid

Subsurface layer
9 to 35 inches; yellowish brown loamy fine sand; moderately acid
35 to 50 inches; light yellowish brown loamy fine sand; moderately acid
50 to 70 inches; light yellowish brown loamy fine sand; moderately acid

Subsoil
70 to 80 inches; strong brown fine sandy loam; strongly acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers increase the maintenance of haul roads and log landings, and reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- A loss of soil productivity may occur following an episode of uncontrolled fire.

Building sites

- These soils are well suited to use as building sites.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- These soils are well suited to use as a site for local roads and streets.

DaE—Darco loamy fine sand, 8 to 15 percent slopes

Map Unit Composition

Major components:
Darco and similar soils: 85 percent

Contrasting inclusions:
Cuthbert soils: 5 percent
Rentzel soils: 5 percent
Tenaha soils: 5 percent

Component Descriptions

Darco

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 8 to 15 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat excessively drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Low (about 5.3 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 6 inches; brown loamy fine sand; very strongly acid

Subsurface layer
6 to 19 inches; light yellowish brown loamy fine sand; very strongly acid
19 to 49 inches; light yellowish brown loamy fine sand; very strongly acid

Subsoil
49 to 54 inches; yellowish brown fine sandy loam; very strongly acid
54 to 61 inches; yellowish brown sandy clay loam; very strongly acid
61 to 74 inches; yellowish brown sandy clay loam; very strongly acid
74 to 80 inches; reddish yellow and yellowish red sandy clay loam; very strongly acid

Use and Management

Cropland

- These soils are not suited to cropland.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The sandiness of the soil may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- Because of the steep slope, special design of local roads and streets is needed.

DsA—Dreka loam, frequently flooded

Map Unit Composition

Major components:
Dreka and similar soils: 75 percent

Contrasting inclusions:
Iulus soils: 15 percent
Laneville soils: 10 percent

Component Descriptions

Dreka

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat poorly drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: Moderate (about 9.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 6 to 30 inches, apparent; from January to May, and November to December
Runoff class: Negligible
Non-irrigated land capability: 5w

Typical Profile

Surface layer
0 to 9 inches; grayish brown loam; moderately acid

Subsoil
9 to 13 inches; light brownish gray clay loam; moderately acid
13 to 30 inches; light brownish gray clay loam; moderately acid
30 to 43 inches; grayish brown clay loam, with yellowish brown and dark yellowish brown masses of oxidized iron, and iron-manganese masses; slightly acid
43 to 80 inches; grayish brown clay, with light olive brown masses of oxidized iron and iron-manganese masses; slightly alkaline

Use and Management

Cropland
- These soils are not suited to cropland.
- Crops are not grown because of frequent flooding.

Pastureland
- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads, increased maintenance costs, and restricts the safe use of roads by log trucks.
- Soil wetness may limit the use of this soil by log trucks.

Building sites
- Because of the hazard of flooding, this soil is not suited to building site development.
- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

EeB—Eastwood very fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Eastwood and similar soils: 95 percent

Contrasting inclusions:
Latex soils: 5 percent

Component Descriptions

Eastwood

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.7 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 7 inches; dark grayish brown very fine sandy loam; very strongly acid

Subsurface layer
7 to 10 inches; brown very fine sandy loam; strongly acid

Subsoil
10 to 19 inches; dark red clay; very strongly acid
19 to 30 inches; dark red clay; very strongly acid
30 to 40 inches; light brownish gray clay; very strongly acid
40 to 55 inches; light brownish gray clay; very strongly acid

Substratum layer
55 to 67 inches; strong brown and light gray sandy clay loam; extremely acid
67 to 80 inches; yellowish red, brownish yellow, and grayish brown clay loam; extremely acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.

- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

EeD—Eastwood very fine sandy loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Eastwood and similar soils: 95 percent

Contrasting inclusions:
Austonio soils: 5 percent

Component Descriptions

Eastwood

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.6 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very high
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 4 inches; brown very fine sandy loam; strongly acid

Subsoil
4 to 13 inches; yellowish red clay; very strongly acid
13 to 30 inches; red clay; very strongly acid
30 to 41 inches; light brownish gray and red clay; very strongly acid
41 to 47 inches; light brownish gray clay; very strongly acid

Substratum layer
47 to 80 inches; dark reddish gray and gray clay loam; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland

- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, restricts the use of equipment for site preparation to the drier periods, and reduces the efficiency of mechanical planting equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

ElA—Eastwood-Latex complex, 1 to 3 percent slopes, mounded

Map Unit Composition

Major components:
Eastwood and similar soils: 50 percent
Latex and similar soils: 35 percent

Contrasting inclusions:
Metcalf and similar soils: 10 percent
Guyton and similar soils: 5 percent

Component Descriptions

Eastwood

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Across-slope shape: Convex

Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 3 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.8 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 6 inches; brown very fine sandy loam; very strongly acid

Subsoil
6 to 14 inches; red clay; very strongly acid
14 to 35 inches; red clay; very strongly acid
35 to 43 inches; light yellowish brown clay loam; very strongly acid

Substratum layer
43 to 80 inches; light yellowish brown, light brownish gray, and brownish yellow silty clay loam; very strongly acid

Latex

MLRA: 133B
Landscape: Coastal plains
Landforms: Mounds on interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Slope: 1 to 3 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: Moderate (about 8.9 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: About 36 to 54 inches, perched; from January to April, and December
Runoff class: Low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 4 inches; brown fine sandy loam; strongly acid

Subsurface layer
4 to 14 inches; light yellowish brown fine sandy loam; strongly acid

Subsoil
14 to 20 inches; yellowish brown loam; very strongly acid
20 to 31 inches; strong brown sandy clay loam; very strongly acid
31 to 35 inches; yellowish brown clay loam, with red masses of oxidized iron, and light brownish gray iron depletions; very strongly acid

35 to 39 inches; red, pale brown, and yellowish brown clay loam, with light brownish gray clay depletions; very strongly acid
39 to 80 inches; strong brown, light brownish gray, and red clay; very strongly acid

Use and Management

Cropland
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment. The low strength increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, restricts the use of equipment for site preparation to the drier periods, and creates unsafe conditions for log trucks.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.

Building sites
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

EtB—Etoile loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Etoile and similar soils: 95 percent

Contrasting inclusions:
Lovelady soils: 5 percent

Component Descriptions

Etoile

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 9.0 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 8 inches; brown loam; with strong brown and grayish brown mottles; slightly acid

Subsoil
8 to 24 inches; red and yellowish brown clay; with light brownish gray mottles; moderately acid
24 to 32 inches; light olive brown clay; with light olive gray, yellowish brown, and yellowish red mottles; neutral
32 to 51 inches; light olive brown clay; with gray and strong brown mottles; moderately alkaline

Substratum layer
51 to 65 inches; strong brown and light olive gray clay; with strong brown mottles; moderately alkaline
65 to 80 inches; reddish yellow clay loam; with light yellowish brown and dark reddish brown mottles; strongly alkaline

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

EtD—Etoile fine sandy loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Etoile and similar soils: 95 percent

Contrasting inclusions:
Lovelady soils: 5 percent

Component Descriptions

Etoile

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 9.0 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very high
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 4 inches; very dark grayish brown fine sandy loam; very strongly acid

Subsoil
4 to 9 inches; yellowish red clay; very strongly acid
9 to 18 inches; reddish yellow clay; moderately acid
18 to 31 inches; olive yellow clay; moderately alkaline
31 to 43 inches; gray clay; moderately alkaline

Substratum layer
43 to 80 inches; gray and yellowish red clay; moderately alkaline

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.

Building sites
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

GaA—Gallime-Alazan complex, 0 to 2 percent slopes

Map Unit Composition

Major components:
Gallime and similar soils: 47 percent
Alazan and similar soils: 35 percent

Contrasting inclusions:
Mollville soils: 15 percent
Iulus soils: 3 percent

Component Descriptions

Gallime

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: High (about 9.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 48 to 72 inches, perched; from January to March, and December
Runoff class: Very low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 4 inches; brown fine sandy loam; slightly acid

Subsurface layer
4 to 25 inches; light yellowish brown fine sandy loam; slightly acid

Subsoil
25 to 33 inches; very pale brown and brownish yellow loam; moderately acid
33 to 45 inches; reddish yellow loam; strongly acid
45 to 53 inches light yellowish brown and yellowish brown sandy clay loam; very strongly acid
53 to 60 inches; light yellowish brown and yellowish brown sandy clay loam; very strongly acid
60 to 66 inches; pale brown and brownish yellow sandy clay loam; very strongly acid
66 to 80 inches; very pale brown, brownish yellow, and red clay loam, with yellowish red masses of oxidized iron and gray masses of reduced iron; very strongly acid

Alazan

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Concave

Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.9 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 18 to 30 inches, apparent; from January to April, and May to December
Runoff class: Very low
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 3 inches; dark grayish brown fine sandy loam; moderately acid

Subsurface layer
3 to 12 inches; yellowish brown fine sandy loam; strongly acid

Subsoil
12 to 21 inches; yellowish brown sandy clay loam, with yellowish brown and yellowish red masses of oxidized iron, and light brownish gray masses of reduced iron; strongly acid
21 to 28 inches; brownish yellow sandy clay loam, with yellowish red masses of oxidized iron and light brownish gray masses of reduced iron; strongly acid
28 to 47 inches; brownish yellow sandy clay loam, with light brownish gray masses of reduced iron; strongly acid
47 to 58 inches; brownish yellow and light brownish gray sandy clay loam; strongly acid
58 to 67 inches; brownish yellow sandy clay loam, with grayish brown and light brownish gray masses of reduced iron; strongly acid
67 to 80 inches; brownish yellow, red, and light brownish gray sandy clay loam; strongly acid

Use and Management

Cropland

- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland

- These soils are well suited to pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development

and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields

- The seasonal high water table in areas of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

GaB—Gallime very fine sandy loam, 1 to 3 percent slopes

Map Unit Composition

Major components:
Gallime and similar soils: 85 percent

Contrasting inclusions:
Alazan soils: 5 percent
Eastwood soils: 5 percent
Mollville soils: 5 percent

Component Descriptions

Gallime

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 1 to 3 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: High (about 9.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 48 to 72 inches, perched; from January to March, and December
Runoff class: Very low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 3 inches; brown very fine sandy loam; strongly acid

Subsurface layer
3 to 12 inches; light yellowish brown fine sandy loam; strongly acid
12 to 20 inches; light yellowish brown fine sandy loam; strongly acid

Subsoil
20 to 24 inches; strong brown and light yellowish brown loam, with light yellowish brown clay depletions; strongly acid

24 to 43 inches; strong brown sandy clay loam, with brownish yellow iron depletions; strongly acid
43 to 80 inches; strong brown clay loam, with yellowish red masses of oxidized iron and very pale brown clay depletions; strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields
- The seasonal high water table in areas of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

GaC—Gallime-Guyton complex, 0 to 2 percent slopes

Map Unit Composition

Major components:
Gallime and similar soils: 48 percent
Guyton and similar soils: 39 percent

Contrasting inclusions:
Metcalf soils: 10 percent
Iulus soils: 3 percent

Component Descriptions

Gallime

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains

Landforms: Mounds on stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.7 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 48 to 72 inches, perched; from January to March, and December
Runoff class: Very low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 8 inches; brown very fine sandy loam; very strongly acid

Subsurface layer
8 to 16 inches; yellowish brown very fine sandy loam; very strongly acid
16 to 27 inches; light yellowish brown very fine sandy loam; very strongly acid

Subsoil
27 to 34 inches; yellowish red sandy clay loam; very strongly acid
34 to 45 inches; yellowish red sandy clay loam; very strongly acid
45 to 56 inches; yellowish red sandy clay loam, with light gray clay depletions; very strongly acid
56 to 66 inches; yellowish red and strong brown sandy clay loam, with strong brown masses of oxidized iron and light gray clay depletions; very strongly acid
66 to 80 inches; yellowish brown and yellowish red sandy clay loam, with plinthite nodules, strong brown masses of oxidized iron, and light gray clay depletions; very strongly acid

Guyton

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flat depressions on flat stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Poorly drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: High (about 11.3 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 0 to 18 inches, perched; from January to May, and December
Runoff class: Negligible
Non-irrigated land capability: 3w

Typical Profile

Surface layer
0 to 5 inches; brown silt loam, with brownish yellow masses of oxidized iron; strongly acid

Subsurface layer
5 to 11 inches; light brownish gray silt loam; very strongly acid
11 to 26 inches; light gray and grayish brown silt loam, with dark yellowish brown masses of oxidized iron; very strongly acid

Subsoil
26 to 42 inches; light brownish gray silt loam, with yellowish brown and dark yellowish brown masses of oxidized iron; very strongly acid
42 to 49 inches; light brownish gray loam, with yellowish brown and dark yellowish brown masses of oxidized iron; very strongly acid
49 to 64 inches; light gray silt loam, with yellowish brown and strong brown masses of oxidized iron, and light brownish gray iron depletions; very strongly acid
64 to 80 inches; light gray silt loam, with strong brown and yellowish brown masses of oxidized iron; very strongly acid

Use and Management

Cropland
- These soils are suitable for prime farmland, if drained.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, increases the cost of constructing haul roads and log landings, harvesting equipment may be difficult to operate and damage may result, and may create unsafe conditions for log trucks.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.

Septic tank absorption fields
- The seasonal high water table in areas of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

GrB—Grapeland loamy fine sand, 1 to 5 percent slopes

Map Unit Composition

Major components:
Grapeland and similar soils: 85 percent

Contrasting inclusions:
Betis soils: 5 percent
Darco soils: 5 percent
Tonkawa soils: 5 percent

Component Descriptions

Grapeland

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Across-slope shape: Convex
Parent material: Sandy residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat excessively drained
Slowest soil permeability: Rapid (about 6.0 in/hr)
Available water capacity: Low (about 5.3 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Negligible
Non-irrigated land capability: 3s

Typical Profile

Surface layer
0 to 6 inches; brown loamy fine sand; strongly acid

Subsoil
6 to 30 inches; yellowish red loamy fine sand; very strongly acid
30 to 68 inches; yellowish red loamy fine sand; very strongly acid
68 to 80 inches; yellowish red loamy fine sand; very strongly acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings, and reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites

- These soils are well suited to use as building sites.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- These soils are well suited to use as a site for local roads and streets.

GtA—Guyton silt loam, 0 to 1 percent slopes

Map Unit Composition

Major components:
Guyton and similar soils: 95 percent

Contrasting inclusions:
Gallime soils: 5 percent

Component Descriptions

Guyton

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flat depressions
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Poorly drained
Slowest soil permeability: Slow (about 0.06 in/hr)

Available water capacity: High (about 11.9 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 0 to 18 inches, perched; from January to May, and December
Runoff class: Low
Non-irrigated land capability: 3w

Typical Profile

Surface layer
0 to 2 inches; brown silt loam; very strongly acid

Subsurface layer
2 to 16 inches; light brownish gray silt loam; very strongly acid

Subsoil
16 to 30 inches; light gray and light brownish gray silty clay loam, with brownish yellow masses of oxidized iron; very strongly acid
30 to 36 inches; light gray and grayish brown silty clay loam, with yellowish brown masses of oxidized iron; very strongly acid
36 to 48 inches; light gray and grayish brown clay loam, with strong brown masses of oxidized iron; very strongly acid
48 to 80 inches; grayish brown clay loam, with strong brown and brownish yellow masses of oxidized iron; very strongly acid

Use and Management

Cropland
- These soils are suitable for prime farmland, if drained.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, increases the cost of constructing haul roads and log landings, harvesting equipment may be difficult to operate and damage may result, and may create unsafe conditions for log trucks.
- Soil wetness may limit the use of this soil by log trucks.

Building sites
- It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance.

Septic tank absorption fields

- Because of the seasonal high water table, this soil is not suited to use as a site for septic tank absorption fields.

Local roads and streets

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

GuA—Guyton-Sawtown complex, mounded

Map Unit Composition

Major components:
Guyton and similar soils: 45 percent
Sawtown and similar soils: 40 percent

Contrasting inclusions:
Metcalf soils: 15 percent

Component Descriptions

Guyton

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Depressions on stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Poorly drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: High (about 11.9 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 0 to 18 inches, perched; from January to May, and December
Runoff class: Low
Non-irrigated land capability: 3w

Typical Profile

Surface layer
0 to 7 inches; grayish brown silt loam, with dark yellowish brown masses of oxidized iron, and dark grayish brown iron depletions; very strongly acid

Subsurface layer
7 to 16 inches; grayish brown silt loam, with brownish yellow and yellowish brown masses of oxidized iron; very strongly acid

Subsoil

16 to 32 inches; grayish brown silty clay loam, with yellowish brown and strong brown masses of oxidized iron; very strongly acid

32 to 80 inches; grayish brown silty clay loam, with strong brown masses of oxidized iron and light brownish gray iron depletions; very strongly acid

Sawtown

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Mounds on stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.6 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 42 to 60 inches, perched; from January to March
Runoff class: Negligible
Non-irrigated land capability: 2e

Typical Profile

Surface layer

0 to 4 inches; brown very fine sandy loam; very strongly acid

Subsurface layer

4 to 19 inches; light yellowish brown very fine sandy loam; very strongly acid

19 to 24 inches; light yellowish brown very fine sandy loam; very strongly acid

Subsoil

24 to 33 inches; brownish yellow clay loam, with strong brown and yellowish red masses of oxidized iron; very strongly acid

33 to 42 inches; brownish yellow clay loam, with red and strong brown masses of oxidized iron; very strongly acid

42 to 80 inches; grayish brown clay, with red and strong brown masses of oxidized iron; very strongly acid

Use and Management

Cropland

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the seasonal high water table, this soil is not suited to use as a site for septic tank absorption fields.

Local roads and streets

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

HaA—Hainesville loamy fine sand, 0 to 2 percent slopes

Map Unit Composition

Major components:
Hainesville and similar soils: 85 percent

Contrasting inclusions:
Mollville soils: 8 percent
Sawlit soils: 7 percent

Component Descriptions

Hainesville

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Alluvial fans stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat excessively drained
Slowest soil permeability: Moderately rapid (about 2.0 in/hr)
Available water capacity: Moderate (about 6.3 inches)
Shrink-swell potential: Low (about 1.5 LEP)

Depth to seasonal water saturation: About 48 to 72 inches, apparent; from January to April, and December
Runoff class: Negligible
Non-irrigated land capability: 3s

Typical Profile

Surface layer
0 to 2 inches; pale brown loamy fine sand; moderately acid

Subsoil
2 to 7 inches; brown loamy fine sand; moderately acid
7 to 22 inches; very pale brown and yellowish brown loamy fine sand; strongly acid
22 to 41 inches; brownish yellow and very pale brown loamy fine sand; strongly acid
41 to 53 inches; yellowish brown loamy fine sand; strongly acid
53 to 70 inches; yellowish brown, light yellowish brown, and very pale brown loamy fine sand; strongly acid
70 to 80 inches; strong brown loamy fine sand; strongly acid

Use and Management

Cropland
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Uncontrolled burning may destroy organic matter.

Building sites
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets
- These soils are well suited to use as a site for local roads and streets.

Hc—Hannahatchee loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Composition

Major components:
Hannahatchee and similar soils: 90 percent

Contrasting inclusions:
Tuscosso soils: 4 percent
Iulus soils: 3 percent
Mattex soils: 3 percent

Component Descriptions

Hannahatchee

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.9 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Negligible
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 4 inches; dark reddish brown loam; slightly acid

Subsoil
4 to 25 inches; reddish brown loam; moderately acid
25 to 35 inches; red clay loam; moderately acid
35 to 50 inches; red clay loam, with light olive brown iron depletions; moderately acid
50 to 62 inches; red and light olive brown clay loam, with light brownish gray iron depletions; moderately acid
62 to 80 inches; reddish brown, strong brown, and light brownish gray sandy clay loam; moderately acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs, and restricts the safe use of roads by log trucks.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. These soils are not suited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- This soil is not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets

- Special design of roads and bridges is needed to prevent the damage caused by flooding.

HeB—Herty loam, 0 to 3 percent slopes

Map Unit Composition

Major components:
Herty and similar soils: 80 percent

Contrasting inclusions:
Fuller soils: 5 percent
Kurth soils: 5 percent
Penning soils: 5 percent
Raylake soils: 5 percent

Component Descriptions

Herty

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from mudstone
Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Moderately well drained

Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 7.4 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: About 6 to 12 inches, perched; from January to April
Runoff class: Medium
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 2 inches; brown loam; moderately acid

Subsurface layer
2 to 7 inches; brown loam; strongly acid

Subsoil
7 to 20 inches; dark gray clay, with yellowish brown masses of oxidized iron; strongly acid
20 to 31 inches; gray clay, with red masses of oxidized iron and gray iron depletions; strongly acid
31 to 45 inches; light yellowish brown clay, with red masses of oxidized iron; strongly acid

Substratum layer
45 to 60 inches; light yellowish brown stratified clay, with brownish yellow and brown masses of oxidized iron; very strongly acid

Use and Management

Cropland
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.
- The movement of water into subsurface drains is restricted.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland
- These soils are well suited to pasture.

Woodland
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness may limit the use of this soil by log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites
- This soil is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance.

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Ia—Iulus fine sandy loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Composition

Major components:
Iulus and similar soils: 90 percent

Contrasting inclusions:
Unnamed soils: 7 percent
Mattex soils: 3 percent

Component Descriptions

Iulus

MLRA: 133B—Western Coastal Plain
Landforms: Flood plains
Landscape: Coastal plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.1 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 18 to 48 inches, perched; from January to April, and December

Runoff class: Negligible
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 4 inches; dark brown fine sandy loam; moderately acid

Subsoil
4 to 10 inches; brown fine sandy loam; strongly acid
10 to 21 inches; yellowish brown fine sandy loam, with light brownish gray iron depletions; strongly acid
21 to 32 inches; brownish yellow fine sandy loam, with light brownish gray iron depletions; strongly acid
32 to 46 inches; light yellowish brown fine sandy loam, with dark yellowish brown masses of oxidized iron and light brownish gray iron depletions; very strongly acid
46 to 80 inches; light brownish gray loamy fine sand, with brownish yellow masses of oxidized iron; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland
- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs, and restricts the safe use of roads by log trucks.

Building sites
- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.
- These soils are not suited to homesites.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets

- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Iu—Iulus fine sandy loam, 0 to 1 percent slopes, frequently flooded

Map Unit Composition

Major components:
Iulus and similar soils: 90 percent

Contrasting inclusions:
Unnamed soils: 7 percent
Mattex soils: 3 percent

Component Descriptions

Iulus

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.8 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 18 to 48 inches, perched; from January to April, and December
Runoff class: Negligible
Non-irrigated land capability: 5w

Typical Profile

Surface layer
0 to 8 inches; dark grayish brown fine sandy loam; strongly acid

Subsoil
8 to 15 inches; dark yellowish brown and yellowish brown fine sandy loam; very strongly acid
15 to 24 inches; yellowish brown and dark yellowish brown fine sandy loam; very strongly acid
24 to 37 inches; yellowish brown and strong brown very fine sandy loam; very strongly acid
37 to 53 inches; light brownish gray very fine sandy loam; very strongly acid
53 to 64 inches; dark yellowish brown and yellowish brown very fine sandy loam; very strongly acid
64 to 80 inches; yellowish brown fine sandy loam; very strongly acid

Use and Management

Cropland

- These soils are not suited to cropland.
- Crops are commonly not grown because of frequent flooding.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, increases the cost of constructing haul roads and log landings, harvesting equipment may be difficult to operate and damage may result, and creates unsafe conditions for log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs, and restricts the safe use of roads by log trucks.
- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the hazard of flooding, this soil is generally unsuited to building site development.

Septic tank absorption fields

- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets

- Special design of roads and bridges is needed to prevent the damage caused by flooding.

KhB—Kirvin fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Kirvin and similar soils: 85 percent

Contrasting inclusions:
Bowie soils: 10 percent
Tenaha soils: 5 percent

Component Descriptions

Kirvin

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Ridges
Geomorphic positions, three-dimensional: Crest
Down-slope shape: Convex

Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 7.7 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 7 inches; dark grayish brown fine sandy loam; strongly acid

Subsurface layer
7 to 12 inches; grayish brown fine sandy loam; strongly acid

Subsoil
12 to 19 inches; yellowish red clay; very strongly acid
19 to 33 inches; red clay; very strongly acid
33 to 40 inches; red clay; very strongly acid
40 to 51 inches; light gray, red, and strong brown clay; very strongly acid

Substratum layer
51 to 57 inches; red, strong brown, and light gray sandy clay loam; very strongly acid
57 to 80 inches; strong brown sandy clay loam; very strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

KiC—Kirvin gravelly fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Kirvin and similar soils: 90 percent

Contrasting inclusions:
Bowie soils: 5 percent
Tenaha soils: 5 percent

Component Descriptions

Kirvin

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Ridges
Geomorphic positions, three-dimensional: Crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 7.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 4 inches; dark grayish brown gravelly fine sandy loam; strongly acid

Subsurface layer
4 to 7 inches; brown gravelly fine sandy loam; strongly acid

Subsoil
7 to 17 inches; red clay; very strongly acid
17 to 24 inches; red clay; very strongly acid
24 to 34 inches; red clay; very strongly acid
34 to 46 inches; red clay; very strongly acid

Substratum layer
46 to 55 inches; red and light brownish gray clay loam; very strongly acid
55 to 80 inches; light brownish gray sandy clay loam; very strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

KiD—Kirvin soils, 2 to 8 percent slopes, graded

Map Unit Composition

Major Components:
Kirvin and similar soils: 100 percent

Component Descriptions

Kirvin

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Clayey residuum weathered from sandstone and shale
Slope: 2 to 8 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 7.5 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 4 inches; red sandy clay loam; very strongly acid

Subsurface layer
4 to 11 inches; red, brownish yellow, and yellowish red sandy clay loam; very strongly acid

Subsoil
11 to 23 inches; reddish brown, brownish yellow, and light brownish gray loam; very strongly acid
23 to 40 inches; weak red, light brownish gray, and light yellowish brown loam; very strongly acid

Substratum layer
40 to 80 inches; red and very pale brown and weak red stratified sandy loam; extremely acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope may restrict the use of some mechanical planting equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

KkD—Kisatchie loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Kisatchie and similar soils: 90 percent

Contrasting inclusions:
Letney soils: 5 percent
Tehran soils: 5 percent

Component Descriptions

Kisatchie

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from siltstone
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Low (about 3.5 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very high
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 3 inches; dark grayish brown loam; strongly acid

Subsurface layer
3 to 5 inches; grayish brown loam; very strongly acid

Subsoil
5 to 9 inches; grayish brown clay; very strongly acid
9 to 18 inches; grayish brown clay; extremely acid
18 to 26 inches; grayish brown and pale brown clay; extremely acid

Substratum layer
26 to 34 inches; light brownish gray and light yellowish brown mudstone bedrock; extremely acid
34 to 60 inches; light yellowish brown mudstone bedrock; extremely acid

Use and Management

Cropland

- These soils are not suited to cropland.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Avoiding overgrazing can reduce the hazard of erosion.

- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

KuB—Kurth fine sandy loam, 1 to 3 percent slopes

Map Unit Composition

Major components:
Kurth and similar soils: 85 percent

Contrasting inclusions:
Fuller soils: 5 percent
Koury soils: 5 percent
Moswell soils: 5 percent

Component Descriptions

Kurth

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 1 to 3 percent
Depth to restrictive feature: Greater than 60 inches to paralithic bedrock
Drainage class: Moderately well drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: Moderate (about 8.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 8 inches; dark grayish brown fine sandy loam; strongly acid

Subsurface layer
8 to 18 inches; pale brown fine sandy loam; moderately acid
18 to 26 inches; pale brown fine sandy loam; moderately acid

Subsoil
26 to 34 inches; yellowish brown and brownish yellow fine sandy loam; strongly acid
34 to 42 inches; yellowish brown and brownish yellow sandy clay loam, with red masses of oxidized iron; strongly acid
42 to 50 inches; gray sandy clay loam, with yellowish brown and weak red masses of oxidized iron; very strongly acid
50 to 61 inches; gray clay, with yellowish brown and yellowish red masses of oxidized; very strongly acid

Substratum layer
61 to 80 inches; pale brown, light yellowish brown, and dark gray stratified sandy clay loam; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- These soils are well suited to cropland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields
- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

KwA—Kawah fine sand, 0 to 2 percent slopes

Map Unit Composition

Major components:
Kawah and similar soils: 90 percent

Contrasting inclusions:
Tonkawa soils: 7 percent
Other soils: 3 percent

Component Descriptions

Kawah

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Drainageways
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy residuum weathered from sandstone and shale
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat poorly drained
Slowest soil permeability: Rapid (about 6.0 in/hr)
Available water capacity: Low (about 3.6 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 18 to 36 inches, apparent; from January to December
Runoff class: Negligible
Non-irrigated land capability: 3w

Typical Profile

Surface layer
0 to 10 inches; dark gray fine sand; strongly acid

Subsurface layer
10 to 22 inches; dark grayish brown fine sand; strongly acid

Substratum layer
22 to 60 inches; light brownish gray fine sand, with brownish yellow masses of oxidized iron; extremely acid
60 to 75 inches; gray fine sand, with yellowish brown masses of oxidized iron; extremely acid
75 to 80 inches; light gray fine sand, with yellowish brown masses of oxidized iron; extremely acid

Use and Management

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings, and may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of uncontrolled fire.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

La—Laneville loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Composition

Major components:
Laneville and similar soils: 90 percent

Contrasting inclusions:
Unnamed soils: 7 percent
Mattex soils: 3 percent

Component Descriptions

Laneville

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: Moderate (about 8.8 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 18 to 36 inches, perched; from January to May, and November to December
Runoff: Negligible
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 6 inches; grayish brown loam; moderately acid

Subsoil
6 to 13 inches; pale brown and light brownish gray loam, with strong brown masses of oxidized iron; very strongly acid
13 to 27 inches; light yellowish brown loam, with yellowish brown masses of oxidized iron and light brownish gray masses of reduced iron; very strongly acid
27 to 42 inches; brown and yellowish brown loam, with light brownish gray masses of reduced iron; very strongly acid
42 to 61 inches; light brownish gray clay loam, with yellowish red, strong brown, and dark yellowish brown masses of oxidized iron; very strongly acid
61 to 80 inches; light brownish gray clay loam, with strong brown, yellowish red, and light yellowish brown masses of oxidized iron; very strongly acid

Use and Management

Cropland

- All areas are prime farmland.
- The rooting depth of crops may be restricted by the high clay content.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs, and restricts the safe use of roads by log trucks.

Building sites

- These soils are not suited to homesites.
- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

LaB—LaCerda clay loam, 0 to 5 percent slopes

Map Unit Composition

Major components:
LaCerda and similar soils: 90 percent

Contrasting inclusions:
Latex soils: 10 percent

Component Descriptions

LaCerda

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Clayey residuum weathered from sandstone and shale
Slope: 0 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.5 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 3 inches; brown clay loam; very strongly acid

Subsoil
3 to 10 inches; red clay, with brown clay depletions; very strongly acid
10 to 18 inches; red clay, with reddish brown clay depletions; extremely acid
18 to 29 inches; red and reddish brown clay, with light brownish gray clay depletions; extremely acid
29 to 43 inches; light olive brown and yellowish red clay, with red clay depletions; moderately acid
43 to 60 inches; light olive brown clay, with brownish yellow clay depletions; neutral

Substratum layer
60 to 80 inches; light olive brown clay, bedrock

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops is restricted by the very high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

LaE—LaCerda clay loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
LaCerda and similar soils: 90 percent

Contrasting inclusions:
Austonio soils: 5 percent
Latex soils: 5 percent

Component Descriptions

LaCerda

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.0 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very high
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 2 inches; brown clay loam; strongly acid

Subsoil
2 to 11 inches; reddish brown clay, with red masses of oxidized iron and light brownish gray iron depletions; very strongly acid
11 to 29 inches; yellowish red clay, with red and strong brown masses of oxidized iron, and light brownish gray masses of reduced iron; very strongly acid
29 to 37 inches; light brownish gray clay, with yellowish red and brownish yellow masses of oxidized iron; very strongly acid
37 to 44 inches; light brownish gray clay, with yellowish brown and red masses of oxidized iron; very strongly acid

Substratum layer
44 to 80 inches; yellowish brown clay, bedrock; moderately acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

Lb—Laneville loam, 0 to 1 percent slopes, frequently flooded

Map Unit Composition

Major components:
Laneville and similar soils: 90 percent

Contrasting inclusions:
Unnamed soils: 7 percent
Mattex soils: 3 percent

Component Descriptions

Laneville

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Depth to restrictive feature: None within 60 inches
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: Moderate (about 8.7 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 18 to 36 inches, perched; from January to May, and November to December
Runoff class: Negligible
Non-irrigated land capability: 5w

Typical Profile

Surface layer
0 to 7 inches; brown loam; very strongly acid

Subsoil
7 to 10 inches; yellowish brown, grayish brown, and dark yellowish brown loam; very strongly acid
10 to 24 inches; yellowish brown, dark yellowish brown, and grayish brown silt loam; very strongly acid
24 to 35 inches; grayish brown clay loam; very strongly acid
35 to 45 inches; grayish brown clay; very strongly acid
45 to 80 inches; grayish brown clay; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.
- Crops are not grown because of frequent flooding.

Pastureland
- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs, and restricts the safe use of roads by log trucks.

Building sites

- Because of the hazard of flooding, this soil is not suited to building site development.
- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- These soils are not suited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

LdB—Latex fine sandy loam, 1 to 3 percent slopes

Map Unit Composition

Major components:
Latex and similar soils: 87 percent

Contrasting inclusions:
Eastwood soils: 8 percent
Metcalf soils: 5 percent

Component Descriptions

Latex

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces, marine terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Slope: 1 to 3 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: High (about 9.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 36 to 54 inches, perched; from January to April, and December
Runoff class: Medium
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 7 inches; brown fine sandy loam; moderately acid

Subsurface layer
7 to 11 inches; brown very fine sandy loam; moderately acid

Subsoil
11 to 22 inches; strong brown loam; strongly acid
22 to 30 inches; strong brown sandy clay loam; very strongly acid
30 to 40 inches; reddish yellow loam, with yellowish red and red masses of oxidized iron, and brownish yellow iron depletions; very strongly acid
40 to 55 inches; brownish yellow loam, with red masses of oxidized iron and pale brown clay depletions; very strongly acid
55 to 58 inches; red clay loam, with dark red masses of oxidized iron, and light brownish gray clay depletions and brownish yellow iron depletions; very strongly acid
58 to 80 inches; dark red clay, with brownish yellow masses of oxidized iron; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- These soils are well suited to cropland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

LiB—Letney loamy sand, 1 to 5 percent slopes

Map Unit Composition

Major components:
Letney and similar soils: 70 percent

Contrasting inclusions:
Tehran soils: 15 percent
Rayburn soils: 10 percent
Lovelady soils: 5 percent

Component Descriptions

Letney

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits
Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately rapid (about 2.0 in/hr)
Available water capacity: Moderate (about 7.3 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very low
Non-irrigated land capability: 3s

Typical Profile

Surface layer
0 to 3 inches; brown loamy sand; moderately acid

Subsurface layer
3 to 24 inches; pale brown loamy sand; moderately acid

Subsoil
24 to 29 inches; brownish yellow sandy clay loam; strongly acid
29 to 33 inches; brownish yellow sandy clay loam; strongly acid
33 to 43 inches; brownish yellow sandy clay loam; strongly acid
43 to 80 inches; red sandy clay loam; strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings, and may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of uncontrolled fire.

Building sites
- These soils are well suited to use as building sites.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets
- These soils are well suited to use as a site for local roads and streets.

LiC—Lilbert loamy fine sand, 1 to 5 percent slopes

Map Unit Composition

Major components:
Lilbert and similar soils: 80 percent

Contrasting inclusions:
Darco soils: 10 percent
Rentzel soils: 5 percent
Iulus soils: 5 percent

Component Descriptions

Lilbert

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained

Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Low (about 6.0 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 3 inches; grayish brown loamy fine sand; slightly acid

Subsurface layer
3 to 36 inches; light yellowish brown loamy fine sand; moderately acid

Subsoil
36 to 45 inches; yellowish brown sandy clay loam, with strong brown and yellowish red masses of oxidized iron; strongly acid
45 to 56 inches; light yellowish brown sandy clay loam, with yellowish brown and red masses of oxidized iron; strongly acid
56 to 62 inches; pale brown, light yellowish brown, and light brownish gray sandy clay loam, with red masses of oxidized iron; very strongly acid
62 to 80 inches; red sandy clay loam, with yellowish brown masses of oxidized iron and light brownish gray iron depletions; very strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The sandy soil may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites
- These soils are well suited to use as building sites.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets
- These soils are well suited to use as a site for local roads and streets.

LiD—Letney loamy sand, 5 to 15 percent slopes

Map Unit Composition

Major components:
Letney and similar soils: 70 percent

Contrasting inclusions:
Tehran soils: 15 percent
Iulus soils: 5 percent
Lovelady soils: 5 percent
Rayburn soils: 5 percent

Component Descriptions

Letney

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits
Slope: 5 to 15 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately rapid (about 2.0 in/hr)
Available water capacity: Moderate (about 6.8 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 6 inches; brown loamy sand; very strongly acid

Subsurface layer
6 to 31 inches; light yellowish brown loamy sand; very strongly acid

Subsoil
31 to 56 inches; red sandy clay loam; very strongly acid
56 to 63 inches; yellowish red sandy loam; very strongly acid
63 to 75 inches; reddish yellow sandy clay loam; very strongly acid
75 to 80 inches; light brownish gray sandy clay loam; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- A loss of soil productivity may occur following an episode of uncontrolled fire.

Building sites
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets
- Because of the steep slope, special design of local roads and streets is needed.

LnB—Lovelady loamy fine sand, 1 to 5 percent slopes

Map Unit Composition

Major components:
Lovelady and similar soils: 85 percent

Contrasting inclusions:
Moswell soils: 10 percent
Herty soils: 5 percent

Component Descriptions

Lovelady

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex

Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 6.3 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 24 to 48 inches, perched; from January to April, and December
Runoff class: Low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 6 inches; brown loamy fine sand; moderately acid

Subsurface layer
6 to 23 inches; pale brown loamy fine sand; moderately acid
23 to 32 inches; light yellowish brown loamy fine sand; moderately acid

Subsoil
32 to 51 inches; yellowish brown sandy clay loam, with red masses of oxidized iron; strongly acid
51 to 55 inches; dark red, grayish brown, and brownish yellow sandy clay loam; strongly acid
55 to 80 inches; grayish brown clay loam; very strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings, and may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

LnD—Lovelady loamy fine sand, 5 to 8 percent slopes

Map Unit Composition

Major components:
Lovelady and similar soils: 85 percent

Contrasting inclusions:
Moswell soils: 10 percent
Herty soils: 5 percent

Component Descriptions

Lovelady

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 5 to 8 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 6.2 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 24 to 48 inches, perched; from January to April, and December
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 4 inches; brown loamy fine sand; moderately acid

Subsurface layer
4 to 26 inches; pale brown loamy fine sand; moderately acid
26 to 38 inches; very pale brown and brownish yellow loamy fine sand; moderately acid

Subsoil
38 to 42 inches; strong brown sandy clay loam, with red masses of oxidized iron; very strongly acid
42 to 63 inches; gray sandy clay, with red and reddish yellow masses of oxidized iron; very strongly acid
63 to 80 inches; grayish brown and light brown sandy clay, with red and reddish yellow masses of oxidized iron, and gray iron depletions; very strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The sandy soil may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

MaE—Maben fine sandy loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Maben and similar soils: 90 percent

Contrasting inclusions:
Tenaha soils: 10 percent

Component Descriptions

Maben

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.6 in/hr)
Available water capacity: Low (about 5.7 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 4 inches; brown fine sandy loam; strongly acid

Subsoil
4 to 14 inches; yellowish red clay loam; very strongly acid
14 to 24 inches; yellowish red clay loam; very strongly acid
24 to 28 inches; reddish brown and yellowish brown silty clay loam; very strongly acid

Substratum layer
28 to 38 inches; strong brown, light yellowish brown, yellowish brown, and light brownish gray silt loam; very strongly acid
38 to 80 inches; light brownish gray and light reddish brown weathered bedrock; very strongly acid

Use and Management

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.
- The rooting depth of plants may be restricted by a dense soil layer.

Woodland

- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, and increases the cost of constructing haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

MaG—Maben fine sandy loam, 15 to 35 percent slopes

Map Unit Composition

Major components:
Maben and similar soils: 90 percent

Contrasting inclusions:
Tenaha soils: 10 percent

Component Descriptions

Maben

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Low (about 4.7 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: High
Non-irrigated land capability: 7e

Typical Profile

Surface layer
0 to 3 inches; brown fine sandy loam; strongly acid

Subsoil
3 to 12 inches; yellowish red clay loam; very strongly acid
12 to 21 inches; yellowish red silty clay; very strongly acid
21 to 25 inches; pale brown silty clay; very strongly acid

Substratum layer
25 to 30 inches; brown clay; very strongly acid
30 to 38 inches; brown weathered bedrock; very strongly acid
38 to 60 inches; brown and strong brown weathered bedrock; very strongly acid

Use and Management

Cropland

- These soils are not suited to cropland.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

- These soils are not recommended for pasture.
- The rooting depth of plants may be restricted by a dense soil layer.

Woodland

- The hazard of erosion is accelerated if the soil is disturbed.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, and increases the cost of constructing haul roads and log landings.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and harvesting and mechanical planting equipment, and restricts the use of equipment for preparing this site for planting and seeding.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Because of the steep slope, the use of mechanical planting equipment is not practical.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

Mf—Mattex clay loam, 0 to 1 percent slopes, frequently flooded

Map Unit Composition

Major components:
Mattex and similar soils: 75 percent

Contrasting inclusions:
Iulus soils: 15 percent
Laneville soils: 10 percent

Component Descriptions

Mattex

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat poorly drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: Moderate (about 9.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 12 to 30 inches, perched; from January to March, and December
Runoff class: Low
Non-irrigated land capability: 5w

Typical Profile

Surface layer
0 to 8 inches; brown clay loam, with dark grayish brown masses of reduced iron; strongly acid

Subsoil layer
8 to 17 inches; dark yellowish brown clay loam, with light brownish gray masses of reduced iron; very strongly acid
17 to 29 inches; gray clay loam, with yellowish red masses of oxidized iron; very strongly acid
29 to 50 inches; gray clay loam, with yellowish red and strong brown masses of oxidized iron; very strongly acid
50 to 80 inches; greenish gray clay, with yellowish red and red masses of oxidized iron; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.
- Crops are commonly not grown because of frequent flooding.

Pastureland
- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness and flooding may limit the use of this soil by log trucks.

Building sites

- Because of the hazard of flooding, this soil is generally unsuited to building site development.
- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

MhC—Meth fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Meth and similar soils: 80 percent

Contrasting inclusions:
Tenaha soils: 20 percent

Component Descriptions

Meth

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Ridges
Geomorphic positions, three-dimensional: Crest
Across-slope shape: Convex
Parent material: Clayey residuum weathered from sandstone and shale

Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: High (about 9.7 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 4 inches; dark grayish brown fine sandy loam; moderately acid

Subsurface layer
4 to 8 inches; brown fine sandy loam; moderately acid

Subsoil
8 to 21 inches; red clay; strongly acid
21 to 30 inches; red clay; strongly acid
30 to 43 inches; red sandy clay loam; very strongly acid
43 to 54 inches; red sandy clay loam; very strongly acid
54 to 69 inches; red sandy clay loam; very strongly acid
69 to 80 inches; yellowish red fine sandy loam; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, increases the cost of constructing haul roads and log landings, harvesting equipment may be difficult to operate and damage may result, and may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Mi—Mattex-Iulus complex, 0 to 1 percent slopes, frequently flooded

Map Unit Composition

Major components:
Mattex and similar soils: 60 percent
Iulus and similar soils: 30 percent

Contrasting inclusions:
Laneville soils: 10 percent

Component Descriptions

Mattex

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat poorly drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: Moderate (about 8.6 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 12 to 30 inches, perched; from January to March, and December
Runoff class: Negligible
Non-irrigated land capability: 5w

Typical Profile

Surface layer
0 to 3 inches; dark grayish brown loam; strongly acid

Subsoil
3 to 15 inches; gray loam, with brown masses of oxidized iron; very strongly acid
15 to 25 inches; grayish brown loam, with reddish brown and brown masses of oxidized iron; very strongly acid
25 to 37 inches; gray sandy clay loam, with reddish brown and strong brown masses of oxidized iron; very strongly acid
37 to 54 inches; gray clay loam, with brown and brownish yellow masses of oxidized iron; very strongly acid

54 to 69 inches; gray clay loam, with brown and yellowish brown masses of oxidized iron; very strongly acid
69 to 80 inches; gray clay loam, with brown and yellowish brown masses of oxidized iron; very strongly acid

Iulus

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 9.0 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 18 to 48 inches, perched; from January to April, and December
Runoff class: Negligible
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 4 inches; grayish brown fine sandy loam; strongly acid

Subsoil
4 to 15 inches; light yellowish brown fine sandy loam, with light brownish gray masses of reduced iron; very strongly acid
15 to 37 inches; light yellowish brown and brownish yellow fine sandy loam, with yellowish brown masses of oxidized iron and light brownish gray masses of reduced iron; very strongly acid
37 to 42 inches; yellowish brown and light brownish gray sandy clay loam, with strong brown masses of oxidized iron; very strongly acid
42 to 50 inches; light brownish gray sandy clay loam, with brownish yellow and strong brown masses of oxidized iron; very strongly acid
50 to 57 inches; light brownish gray loam, with strong brown and light yellowish brown masses of oxidized iron; very strongly acid
57 to 80 inches; light brownish gray fine sandy loam, with yellowish red, light yellowish brown, and strong brown masses of oxidized iron; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.
- Crops are commonly not grown because of frequent flooding.

Pastureland
- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

- Restricting grazing during wet periods can minimize compaction.

Woodland

- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness and flooding may limit the use of this soil by log trucks.

Building sites

- Because of the hazard of flooding, this soil is not suited to building site development.
- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

MiQ—Mine or Quarry

Map Unit Composition

Major components:
Mine or quarry and similar soils: 85 percent

Contrasting inclusions:
Kirvin soils: 10 percent. These soils have a clayey control-section and they occur on knobs and ridges.
Tenaha soils: 5 percent. These soils have a sandy epipedon 20 to 40 inches thick and they occur on ridges and side slopes.

Component Descriptions

Mine or Quarry

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 1 to 2 percent
Drainage class: Well drained
Slowest soil permeability: Slow (about 0.06 in/hr)

Depth to seasonal water saturation: Greater than 6 feet
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 1 inch; reddish brown gravelly fine sandy loam; moderately acid

Subsoil
1 to 9 inches; yellowish red fine sandy loam; strongly acid

Substratum layer
9 to 29 inches; strong brown loamy fine sand; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The limited available water capacity inhibits root development and increases the seedling mortality rate.
- The low soil reaction may cause a nutrient imbalance in seedlings.

Building sites
- These soils are well suited to use as building sites.

Septic tank absorption fields
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets
- These soils are well suited to use as a site for local roads and streets.

MiS—Metcalf-Sawtown complex, 0 to 2 percent slopes

Map Unit Composition

Major components:
Metcalf and similar soils: 45 percent
Sawtown and similar soils: 35 percent

Contrasting inclusions:
Eastwood soils: 10 percent
Wrightsville soils: 10 percent

Component Descriptions

Metcalf

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces, marine terraces
Geomorphic positions, three-dimensional: Tread

Across-slope shape: Linear
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat poorly drained
Slowest soil permeability: Very slow to impermeable (about 0.001 in/hr)
Available water capacity: High (about 10.3 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: About 18 to 30 inches, perched; from January to April, and December
Runoff class: Medium
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 7 inches; dark grayish brown very fine sandy loam; very strongly acid

Subsurface layer
7 to 11 inches; pale brown and brownish yellow loam, with yellowish brown masses of oxidized iron; extremely acid

Subsoil
11 to 17 inches; brownish yellow loam, with strong brown masses of oxidized iron, and pale brown and light brownish gray iron depletions; very strongly acid
17 to 35 inches; pale brown loam, with red masses of oxidized iron, very pale brown and light brownish gray iron depletions; strongly acid
35 to 80 inches; red, gray, and yellowish brown clay; strongly acid

Sawtown

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Mounds on stream terraces, mounds on marine terraces
Across-slope shape: Convex
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.5 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 36 to 54 inches, perched; from January to March
Runoff class: Low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 11 inches; brown very fine sandy loam, with dark grayish brown masses of oxidized iron; very strongly acid

Subsurface layer
11 to 25 inches; pale brown very fine sandy loam; strongly acid
25 to 30 inches; pale brown very fine sandy loam, with yellowish brown masses of oxidized iron; strongly acid

Subsoil

30 to 37 inches; yellowish brown loam, with red masses of oxidized iron; very strongly acid

37 to 49 inches; brownish yellow loam, with red masses of oxidized iron, pale brown clay depletions, and light brownish gray iron depletions; very strongly acid

49 to 80 inches; gray clay loam, with brownish yellow and red masses of oxidized iron, and pale brown clay depletions; very strongly acid

Use and Management

Cropland

- All areas are prime farmland.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, increases the cost of constructing haul roads and log landings, harvesting equipment may be difficult to operate and damage may result, and may create unsafe conditions for log trucks (fig 3).

Figure 3.—Loblolly pine grown on an area of Metcalf-Sawtown complex, 0 to 2 percent slopes. Woodland management practices, such as a prescribed burn was recently applied to this area.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

MpA—Mollville-Besner complex, 0 to 1 percent slopes, mounded

Map Unit Composition

Major components:
Mollville and similar soils: 45 percent
Besner and similar soils: 40 percent

Contrasting inclusions:
Alazan soils: 15 percent

Component Descriptions

Mollville

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Depressions on stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Poorly drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: High (about 9.3 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Ponding hazard: Frequent

Depth to seasonal water saturation: At the surface, apparent; from January to June, and November to December
Runoff class: Low
Non-irrigated land capability: 4w

Typical Profile

Surface layer
0 to 5 inches; dark grayish brown loam, with dark yellowish brown masses of oxidized iron and very dark grayish brown iron depletions; very strongly acid

Subsurface layer
5 to 9 inches; gray loam; very strongly acid

Subsoil
9 to 17 inches; grayish brown clay loam, with dark yellowish brown masses of oxidized iron and light brownish gray clay depletions; very strongly acid
17 to 35 inches; grayish brown clay loam, with yellowish brown masses of oxidized iron and light brownish gray clay depletions; moderately acid
35 to 57 inches; grayish brown clay loam, with strong brown masses of oxidized iron and light brownish gray clay depletions; moderately acid
57 to 76 inches; grayish brown loam, with strong brown masses of oxidized iron and light brownish gray clay depletions; slightly alkaline

Substratum layer
76 to 80 inches; grayish brown fine sandy loam, with strong brown masses of oxidized iron and light yellowish brown masses of oxidized iron; slightly alkaline

Besner

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Mounds on stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.8 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 48 to 72 inches, apparent; from January to February
Runoff class: Very low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 7 inches; brown fine sandy loam; moderately acid

Subsurface layer
7 to 21 inches; very pale brown fine sandy loam; strongly acid
21 to 39 inches; light yellowish brown and brownish yellow fine sandy loam; strongly acid
39 to 46 inches; light yellowish brown and yellow fine sandy loam; strongly acid

Subsoil
46 to 80 inches; brownish yellow loam, with pale brown clay depletions; very strongly acid

Use and Management

Cropland
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.

Woodland
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Soil wetness and ponding may limit the use of this soil by log trucks.

Building sites
- The soil is not suited to building site development.
- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed.

Septic tank absorption fields
- Because of ponding, this soil is not suited to use as a site for septic tank absorption fields.

Local roads and streets
- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

MsB—Moswell loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Moswell and similar soils: 85 percent

Contrasting inclusions:
Herty soils: 5 percent
Kurth soils: 5 percent
Penning soils: 5 percent

Component Descriptions

Moswell

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.7 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 2 inches; very dark grayish brown loam; moderately acid

Subsurface layer
2 to 5 inches; brown loam; moderately acid

Subsoil
5 to 13 inches; yellowish red clay; very strongly acid
13 to 36 inches; light brownish gray clay; very strongly acid
36 to 43 inches; yellowish brown clay, with strong brown manganese coatings; very strongly acid

Substratum layer
43 to 58 inches; light yellowish brown and brown stratified silty clay loam, with greenish gray masses of reduced iron; extremely acid
58 to 80 inches; brown and light brownish gray and yellowish brown stratified silty clay loam; extremely acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The rooting depth of crops is restricted by the very high clay content.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

MsD—Moswell loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Moswell and similar soils: 90 percent

Contrasting inclusions:
Kurth soils: 5 percent
Lovelady soils: 5 percent

Component Descriptions

Moswell

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: High (about 9.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very high
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 5 inches; very dark grayish brown loam; strongly acid

Subsurface layer
5 to 8 inches; dark grayish brown loam; strongly acid

Subsoil
8 to 14 inches; dark brown and reddish brown clay; very strongly acid
14 to 25 inches; gray, red, and reddish brown clay; very strongly acid
25 to 42 inches; brown clay; extremely acid

Substratum layer
42 to 71 inches; light olive brown silty clay; extremely acid
71 to 80 inches; grayish brown silty clay; extremely acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

NaB—Naclina clay loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Naclina and similar soils: 93 percent

Contrasting inclusions:
Latex soils: 5 percent
Metcalf soils: 2 percent

Component Descriptions

Naclina

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: High (about 9.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 1 inch; dark brown clay loam; neutral
1 to 4 inches; brown clay loam; slightly acid

Subsoil
4 to 15 inches; strong brown and yellowish red clay; strongly acid
15 to 25 inches; yellowish red and light olive brown clay; moderately acid
25 to 52 inches; yellowish brown clay; slightly alkaline

Substratum layer
52 to 63 inches; pale green, very pale brown, light yellowish brown, and brownish yellow clay; slightly alkaline
63 to 89 inches; light gray, brownish yellow, and light yellowish brown clay

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

NaD—Naclina clay, 5 to 15 percent slopes

Map Unit Composition

Major components:
Naclina and similar soils: 92 percent

Contrasting inclusions:
Austonio soils: 5 percent
Latex soils: 3 percent

Component Descriptions

Naclina

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 9.0 inches)
Shrink-swell potential: High (about 7.5 LEP)

Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very high
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 3 inches; dark brown clay; moderately acid

Subsoil
3 to 12 inches; reddish brown clay; strongly acid
12 to 17 inches; yellowish red clay; strongly acid
17 to 25 inches; yellowish brown clay; moderately acid
25 to 31 inches; light brownish gray clay; slightly alkaline
31 to 42 inches; gray clay; slightly alkaline

Substratum layer
42 to 59 inches; grayish brown; slightly alkaline
59 to 80 inches; gray; slightly alkaline

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.

Building sites
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, designing local roads and streets is difficult.

NeB—Nacogdoches fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Nacogdoches and similar soils: 85 percent

Contrasting inclusions:
Alto soils: 15 percent

Component Descriptions

Nacogdoches

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from glauconitic sandstone
Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 8.8 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 7 inches; dark reddish brown fine sandy loam; strongly acid

Subsoil
7 to 41 inches; dark red clay; strongly acid
41 to 49 inches; dark red clay; very strongly acid
49 to 80 inches; red clay; very strongly acid

Use and Management

Cropland

- All areas are prime farmland.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

NeE—Nacogdoches clay loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Nacogdoches and similar soils: 90 percent

Contrasting inclusions:
Trawick soils: 5 percent
Alto soils: 3 percent
Hannahatchee soils: 2 percent

Component Descriptions

Nacogdoches

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from glauconitic sandstone
Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 9.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 6 inches; dark reddish brown clay loam; moderately acid

Subsoil
6 to 12 inches; dark red clay; strongly acid
12 to 35 inches; dark red clay; strongly acid
35 to 60 inches; dark red clay; strongly acid
60 to 80 inches; dark red clay; strongly acid

Use and Management

Cropland

- All areas are prime farmland.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Ow—Owentown fine sandy loam, occasionally flooded

Map Unit Composition

Major components:
Owentown and similar soils: 80 percent

Contrasting inclusions:
Iulus soils: 10 percent
Laneville soils: 5 percent
Mattex soils: 5 percent

Component Descriptions

Owentown

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.2 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 30 to 48 inches, apparent; from January to June, and October to December
Runoff class: Negligible
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 3 inches; brown fine sandy loam; moderately acid

Subsoil
3 to 22 inches; yellowish brown fine sandy loam, with light yellowish brown masses of oxidized iron; strongly acid
22 to 34 inches; yellowish brown and strong brown fine sandy loam; strongly acid
34 to 50 inches; yellowish brown fine sandy loam, with yellowish red masses of oxidized iron and light brownish gray masses of reduced iron; strongly acid
50 to 80 inches; yellowish brown and light brownish gray fine sandy loam; strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland
- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.

Building sites
- These soils are not suited to homesites.
- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings.
- Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields
- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

PeC—Penning-Kurth complex, 0 to 2 percent slopes

Map Unit Composition

Major components:
Penning and similar soils: 50 percent
Kurth and similar soils: 40 percent

Contrasting inclusions:
Moswell soils: 10 percent

Component Descriptions

Penning

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to paralithic, densic
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 7.2 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 18 to 48 inches, perched; from January to April
Runoff class: Low
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 4 inches; brown loam; very strongly acid

Subsurface layer
4 to 14 inches; pale brown loam, with brownish yellow masses of oxidized iron; very strongly acid

Subsoil
14 to 34 inches; brownish yellow sandy clay loam, with light brownish gray iron depletions; very strongly acid
34 to 48 inches; grayish brown sandy clay loam, with strong brown masses of oxidized iron; very strongly acid
48 to 56 inches; grayish brown sandy clay loam; very strongly acid

Substratum layer
56 to 80 inches; pale yellow stratified clay loam; strongly acid

Kurth

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale

Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: Moderate (about 8.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 7 inches; brown fine sandy loam; strongly acid

Subsurface layer
7 to 21 inches; pale brown fine sandy loam; strongly acid
21 to 28 inches; pale brown fine sandy loam, with yellowish brown masses of oxidized iron; strongly acid

Subsoil
28 to 35 inches; yellowish brown sandy clay loam, with light brownish gray iron depletions; strongly acid
35 to 46 inches; dark red and brown sandy clay loam, with light brownish gray iron depletions; strongly acid
46 to 62 inches; light brownish gray clay loam, with red and yellowish brown masses of oxidized iron; very strongly acid

Substratum layer
62 to 80 inches; yellow stratified loam; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- These soils are well suited to cropland.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, increases the cost of constructing haul roads and log landings, harvesting equipment may be difficult to operate and damage may result, and may create unsafe conditions for log trucks.

Building sites
- These soils are poorly suited to building site development and structures may need special design to avoid damage from wetness.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance.

Septic tank absorption fields
- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

PoA—Pophers silt loam, 0 to 1 percent slopes, frequently flooded

Map Unit Composition

Major components:
Pophers and similar soils: 85 percent

Contrasting inclusions:
Other soils: 15 percent

Component Descriptions

Pophers

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat poorly drained
Slowest soil permeability: Slow (about 0.06 in/hr)
Available water capacity: High (about 10.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 12 to 24 inches, apparent; from January to May, and December
Runoff class: Negligible
Non-irrigated land capability: 5w

Typical Profile

Surface layer
0 to 2 inches; grayish brown silt loam, with strong brown masses of oxidized iron; strongly acid

Subsoil
2 to 18 inches; grayish brown silt loam, with strong brown, light yellowish brown, and light yellowish brown masses of reduced iron; very strongly acid
18 to 28 inches; light brownish gray silt loam; very strongly acid
28 to 43 inches; grayish brown silty clay loam, with brownish yellow and strong brown masses of oxidized iron; very strongly acid
43 to 64 inches; grayish brown silty clay loam, with strong brown and brownish yellow masses of oxidized iron; very strongly acid
64 to 80 inches; dark gray silty clay loam, with strong brown masses of oxidized iron; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.
- Crops are commonly not grown because of frequent flooding.

Pastureland
- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness and flooding may limit the use of this soil by log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites
- Because of the hazard of flooding, this soil is generally unsuited to building site development.
- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters.

Septic tank absorption fields
- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

RaD—Rayburn loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Rayburn and similar soils: 85 percent

Contrasting inclusions:
Corrigan soils: 10 percent
Letney soils: 5 percent

Component Descriptions

Rayburn

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and siltstone
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 6.6 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: About 30 to 54 inches, perched; from January to February, and December
Runoff class: Very high
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 5 inches; dark brown loam; strongly acid

Subsoil
5 to 13 inches; light olive brown clay; very strongly acid
13 to 21 inches; pinkish gray, strong brown, and red clay; very strongly acid
21 to 33 inches; red clay; very strongly acid
33 to 43 inches; light gray clay; very strongly acid

Substratum layer
43 to 52 inches; light gray clay; extremely acid
52 to 72 inches; light gray shale and siltstone bedrock; extremely acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.

- The stickiness of the soil reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, designing local roads and streets is difficult.

RkB—Raylake clay, 1 to 5 percent slopes

Map Unit Composition

Major components:
Raylake and similar soils: 85 percent

Contrasting inclusions:
Other soils: 10 percent
Kurth soils: 5 percent

Component Descriptions

Raylake

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex

Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Somewhat poorly drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.5 inches)
Shrink-swell potential: Very high (about 17.0 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 6 inches; dark brown clay; very strongly acid

Subsoil
6 to 15 inches; brown clay; strongly acid
15 to 25 inches; very dark grayish brown clay; strongly acid
25 to 33 inches; dark grayish brown clay; very strongly acid
33 to 61 inches; brown clay; very strongly acid

Substratum layer
61 to 80 inches; yellowish brown clay; very strongly acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.

- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

RkD—Raylake clay loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Raylake and similar soils: 95 percent

Contrasting inclusions:
Kurth soils: 5 percent

Component Descriptions

Raylake

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Somewhat poorly drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.8 inches)
Shrink-swell potential: Very high (about 17.0 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very high
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 3 inches; brown clay loam

Subsoil
3 to 9 inches; reddish brown clay
9 to 23 inches; yellowish red clay
23 to 36 inches; grayish brown clay
36 to 58 inches; brown clay

Substratum layer
58 to 72 inches; yellowish brown and grayish brown clay, bedrock

Use and Management

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, restricts the use of some mechanical planting equipment.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

RnB—Rentzel loamy fine sand, 0 to 5 percent slopes

Map Unit Composition

Major components:
Rentzel and similar soils: 75 percent

Contrasting inclusions:
Lilbert soils: 10 percent
Iulus soils: 5 percent
Naconiche soils: 5 percent
Tenaha soils: 5 percent

Component Descriptions

Rentzel

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 0 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 6.1 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: About 18 to 36 inches, perched; from January to March
Runoff class: Very low
Non-irrigated land capability: 3w

Typical Profile

Surface layer
0 to 3 inches; dark grayish brown loamy fine sand; very strongly acid

Subsurface layer
3 to 28 inches; pale brown loamy fine sand; very strongly acid

Subsoil
28 to 38 inches; yellowish brown fine sandy loam, with brownish yellow and red masses of oxidized iron, and light brownish gray masses of reduced iron; very strongly acid
38 to 50 inches; light brownish gray, yellowish red, and yellowish brown fine sandy loam; very strongly acid
50 to 58 inches; yellowish brown, light brownish gray, and red fine sandy loam; very strongly acid
58 to 80 inches; gray fine sandy loam, with red and yellowish brown masses of oxidized iron; very strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The sandiness of the soil may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

RsB—Rosenwall fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Rosenwall and similar soils: 85 percent

Contrasting inclusions:
Other soils: 5 percent
Kurth soils: 5 percent
Penning soils: 5 percent

Component Descriptions

Rosenwall

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains

Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Low (about 3.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 4 inches; dark grayish brown fine sandy loam, grayish brown, dry; strongly acid

Subsoil
4 to 12 inches; reddish brown clay; very strongly acid
12 to 19 inches; yellowish red clay; very strongly acid
19 to 24 inches; dark reddish gray and reddish yellow stratified loam to clay; very strongly acid

Substratum layer
24 to 80 inches; very pale brown fine sandy loam; very strongly acid

Use and Management

Cropland
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The rooting depth of crops is restricted by the very high clay content.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.

RsD—Rosenwall fine sandy loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Rosenwall and similar soils: 90 percent

Contrasting inclusions:
Kurth soils: 5 percent
Penning soils: 5 percent

Component Descriptions

Rosenwall

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Low (about 3.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very high
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 5 inches; grayish brown fine sandy loam; strongly acid

Subsoil
5 to 13 inches; reddish brown clay; very strongly acid
13 to 24 inches; red clay; very strongly acid
24 to 32 inches; yellowish red clay; very strongly acid

Substratum layer
32 to 50 inches; brown stratified clay; very strongly acid

50 to 60 inches; strong brown stratified sandy clay loam; very strongly acid
60 to 80 inches; brown stratified clay; very strongly acid

Use and Management

Cropland

- These soils are not suited to cropland.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings, reduces the efficiency of mechanical planting equipment, and restricts the use of equipment for site preparation to the drier periods.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.

Building sites

- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

SaB—Sacul fine sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Sacul and similar soils: 85 percent

Contrasting inclusions:
Alazan soils: 10 percent
Kirvin soils: 5 percent

Component Descriptions

Sacul

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Head slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 80 inches to densic material
Drainage class: Moderately well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Low (about 5.7 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 24 to 48 inches, perched; from January to April, and December
Runoff class: Medium
Non-irrigated land capability: 4e

Typical Profile

Surface layer
0 to 4 inches; brown fine sandy loam; very strongly acid

Subsurface layer
4 to 12 inches; yellowish brown fine sandy loam; very strongly acid

Subsoil
12 to 18 inches; red clay, with pale brown iron depletions; very strongly acid
18 to 32 inches; red clay, with dark yellowish brown and strong brown masses of oxidized iron, and light brownish gray iron depletions; very strongly acid
32 to 39 inches; red and light brownish gray clay, with strong brown masses of oxidized iron; extremely acid
39 to 53 inches; light brownish gray sandy clay, with dark red and strong brown masses of oxidized iron; extremely acid
53 to 62 inches; gray clay loam, with dark red and strong brown masses of oxidized iron; extremely acid

Substratum layer
62 to 80 inches; gray clay loam, with strong brown masses of oxidized iron, red masses of oxidized iron, and gray iron depletions; very strongly acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The rooting depth of crops may be restricted by the high clay content.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

SeB—Sawlit fine sandy loam, 0 to 3 percent slopes

Map Unit Composition

Major components:
Sawlit and similar soils: 80 percent

Contrasting inclusions:
Mollville soils: 10 percent
Sawtown soils: 10 percent

Component Descriptions

Sawlit

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 3 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: High (about 9.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 24 to 42 inches, perched; from January to March
Runoff class: Medium
Non-irrigated land capability: 2w

Typical Profile

Surface layer
0 to 9 inches; dark grayish brown fine sandy loam; very strongly acid

Subsurface layer
9 to 12 inches; light yellowish brown fine sandy loam, with strong brown masses of oxidized iron and light brownish gray masses of reduced iron; very strongly acid

Subsoil
12 to 25 inches; reddish yellow, light brownish gray, light yellowish brown, and grayish brown sandy clay loam, with yellow, yellowish red, and brown masses of oxidized iron; very strongly acid
25 to 31 inches; light brownish gray and gray clay loam, with strong brown and red masses of oxidized iron, and red iron-manganese masses; very strongly acid
31 to 43 inches; light brownish gray and light gray clay loam, with yellowish brown and red masses of oxidized iron, and red iron-manganese masses; very strongly acid
43 to 57 inches; gray and light gray clay, with red masses and brownish yellow masses of oxidized iron, and reddish brown iron-manganese masses; very strongly acid
57 to 80 inches; light gray and light gray clay, with brownish yellow and dark reddish brown masses of oxidized iron, and dark reddish brown iron-manganese masses; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Severe shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures generally require special design and construction techniques or intensive maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets
- This soil is poorly suited to use as base material for local roads and streets because of the severe shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

SfA—Sawtown very fine sandy loam, 0 to 2 percent slopes

Map Unit Composition

Major components:
Sawtown and similar soils: 85 percent

Contrasting inclusions:
Guyton soils: 10 percent
Metcalf soils: 5 percent

Component Descriptions

Sawtown

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains

Landforms: Stream terraces, marine terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Slope: 0 to 2 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Very slow (about 0.001 in/hr)
Available water capacity: Moderate (about 8.4 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: About 42 to 60 inches, perched; from January to March
Runoff class: Low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 4 inches; brown very fine sandy loam; very strongly acid

Subsurface layer
4 to 15 inches; light yellowish brown fine sandy loam; very strongly acid
15 to 30 inches; very pale brown fine sandy loam, with yellow masses of oxidized iron; very strongly acid

Subsoil
30 to 39 inches; yellowish brown clay loam, with red and yellowish red masses of oxidized iron; strongly acid
39 to 45 inches; yellowish brown clay loam, with red and yellowish red masses of oxidized iron; strongly acid
45 to 54 inches; brownish yellow clay loam, with red masses of oxidized iron and light yellowish brown clay depletions; strongly acid
54 to 80 inches; light brownish gray and red clay, with reddish yellow masses of oxidized iron, and light yellowish brown and brownish yellow iron depletions; strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.

SmB—Smithdale sandy loam, 1 to 5 percent slopes

Map Unit Composition

Major components:
Smithdale and similar soils: 90 percent

Contrasting inclusions:
Bowie soils: 10 percent

Component Descriptions

Smithdale

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderate (about 0.6 in/hr)
Available water capacity: Moderate (about 8.5 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 3e

Typical Profile

Surface layer
0 to 1 inches; brown sandy loam; strongly acid
1 to 5 inches; yellowish brown sandy loam; strongly acid

Subsoil
5 to 11 inches; reddish brown sandy loam; strongly acid
11 to 36 inches; red sandy clay loam; very strongly acid
36 to 51 inches; red fine sandy loam; very strongly acid
51 to 80 inches; yellowish red fine sandy loam; very strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

Pastureland
- Erosion control is needed when pastures are renovated.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Rock fragments obstruct the use of mechanical planting equipment.

Building sites
- These soils are well suited to use as building sites.

Septic tank absorption fields
- These soils are well suited to use as a site for septic tank absorption fields.

Local roads and streets
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

TeD—Tehran loamy sand, 5 to 15 percent slopes

Map Unit Composition

Major components:
Tehran and similar soils: 86 percent

Contrasting inclusions:
Rayburn soils: 14 percent

Component Descriptions

Tehran

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Somewhat excessively drained
Slowest soil permeability: Moderately rapid (about 2.0 in/hr)
Available water capacity: Low (about 4.8 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 17 inches; brown loamy sand; very strongly acid

Subsurface layer
17 to 26 inches; dark yellowish brown loamy sand; very strongly acid
26 to 59 inches; yellowish brown loamy sand; very strongly acid
59 to 73 inches; pale brown loamy sand; very strongly acid

Subsoil
73 to 80 inches; strong brown sandy loam; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, may reduce the traction of wheeled harvest equipment and log trucks, and restricts the use of some mechanical planting equipment.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of uncontrolled fire.

Building sites
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets
- Because of the steep slope, special design of local roads and streets is needed.

TnB—Tenaha loamy fine sand, 1 to 5 percent slopes

Map Unit Composition

Major components:
Tenaha and similar soils: 90 percent

Contrasting inclusions:
Cuthbert soils: 5 percent
Kirvin soils: 5 percent

Component Descriptions

Tenaha

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 6.3 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 3s

Typical Profile

Surface layer
0 to 4 inches; brown loamy fine sand; moderately acid

Subsurface layer
4 to 17 inches; pale brown loamy fine sand; strongly acid
17 to 24 inches; light yellowish brown loamy fine sand; very strongly acid

Subsoil
24 to 38 inches; yellowish red sandy clay loam; very strongly acid
38 to 47 inches; red sandy clay loam; very strongly acid

Substratum layer
47 to 80 inches; red fine sandy loam; very strongly acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The sandiness of the soil may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites

- These soils are well suited to use as building sites.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

TnD—Tenaha loamy fine sand, 5 to 15 percent slopes

Map Unit Composition

Major components:
Tenaha and similar soils: 85 percent

Contrasting inclusions:
Cuthbert soils: 10 percent
Rentzel soils: 5 percent

Component Descriptions

Tenaha

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 6.4 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 3 inches; dark brown loamy fine sand; strongly acid

Subsurface layer
3 to 24 inches; yellowish brown loamy fine sand; strongly acid

Subsoil
24 to 30 inches; dark yellowish brown sandy clay loam; very strongly acid
30 to 40 inches; strong brown sandy clay loam; very strongly acid
40 to 51 inches; red and strong brown sandy loam; very strongly acid

Substratum layer
51 to 80 inches; red and reddish yellow sandy loam; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.
- The sandiness of the soil may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, designing local roads and streets is difficult.

TnG—Tenaha loamy fine sand, 15 to 35 percent slopes

Map Unit Composition

Major components:
Tenaha and similar soils: 80 percent

Contrasting inclusions:
Cuthbert soils: 10 percent
Rentzel soils: 10 percent

Component Descriptions

Tenaha

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 15 to 35 percent
Depth to restrictive feature: 40 to 60 inches to bedrock, densic material
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Moderate (about 6.4 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: High
Non-irrigated land capability: 7e

Typical Profile

Surface layer
0 to 3 inches; brown loamy fine sand; strongly acid

Subsurface layer
3 to 21 inches; pale brown loamy fine sand; strongly acid

Subsoil
21 to 29 inches; strong brown sandy clay loam; very strongly acid
29 to 35 inches; reddish yellow and strong brown sandy clay loam; very strongly acid
35 to 43 inches; strong brown sandy clay loam; very strongly acid

Substratum layer
43 to 49 inches; light yellowish brown fine sandy loam; very strongly acid
49 to 80 inches; light yellowish brown, pale brown, and brownish yellow fine sandy loam; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- These soils are not recommended for pasture.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings, creates unsafe operating conditions and reduces the operating efficiency of log trucks, creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment, increases the cost of constructing haul roads and log landings.
- The sandiness of the soil may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Because of the steep slope, the use of mechanical planting equipment is not practical, and restricts the use of equipment for preparing this site for planting and seeding.
- Rock fragments obstruct the use of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

TsB—Tonkawa fine sand, 0 to 8 percent slopes

Map Unit Composition

Major components:
Tonkawa and similar soils: 85 percent

Contrasting inclusions:
Kawah soils: 10 percent
Naconiche soils: 5 percent

Component Descriptions

Tonkawa

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy residuum weathered from sandstone and shale
Slope: 0 to 8 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Excessively drained
Slowest soil permeability: Rapid (about 6.0 in/hr)
Available water capacity: Low (about 3.6 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very low
Non-irrigated land capability: 4s

Typical Profile

Surface layer
0 to 15 inches; brown fine sand; moderately acid

Substratum layer
15 to 80 inches; very pale brown fine sand; strongly acid

Use and Management

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The sandy layers in this soil increase the maintenance of haul roads and log landings, and reduces the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of uncontrolled fire.

Building sites
- These soils are well suited to use as building sites.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets
- These soils are well suited to use as a site for local roads and streets.

TsD—Tonkawa fine sand, 8 to 15 percent slopes

Map Unit Composition

Major components:
Tonkawa and similar soils: 85 percent

Contrasting inclusions:
Kawah soils: 10 percent
Naconiche soils: 5 percent

Component Descriptions

Tonkawa

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy residuum weathered from sandstone and shale
Slope: 8 to 15 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Excessively drained
Slowest soil permeability: Rapid (about 6.0 in/hr)
Available water capacity: Low (about 3.6 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Low
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 7 inches; brown fine sand; very strongly acid

Substratum layer
7 to 15 inches; pale brown fine sand; very strongly acid
15 to 37 inches; light yellowish brown fine sand; very strongly acid
37 to 60 inches; very pale brown fine sand; very strongly acid
60 to 80 inches; very pale brown fine sand; extremely acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and may restrict the use of some mechanical planting equipment.
- The sandiness of the soil may reduce the traction of wheeled harvest equipment and log trucks.
- Sandy layers may slough, thus reducing the efficiency of mechanical planting equipment.
- Uncontrolled burning may destroy organic matter.

Building sites
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- Because of the steep slope, special design of local roads and streets is needed.

Tu—Tuscosso loam, 0 to 1 percent slopes, frequently flooded

Map Unit Composition

Major components:
Tuscosso and similar soils: 85 percent

Contrasting inclusions:
Chireno soils: 5 percent
Hannahatchee soils: 5 percent
Mattex soils: 5 percent

Component Descriptions

Tuscosso

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: High (about 9.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 30 to 42 inches, apparent; from January to June
Runoff class: Negligible
Non-irrigated land capability: 5w

Typical Profile

Surface layer
0 to 5 inches; dark brown loam and brown, dry; slightly acid

Subsoil
5 to 11 inches; dark brown and brown clay loam, with yellowish red masses of oxidized iron; slightly acid
11 to 25 inches; strong brown clay loam, with brown masses of oxidized iron; slightly acid

25 to 40 inches; dark yellowish brown clay loam, with yellowish red masses of oxidized iron, and dark grayish brown masses of reduced iron; slightly acid
40 to 64 inches; dark yellowish brown silty clay loam; moderately acid
64 to 80 inches; brown clay loam; slightly acid

Use and Management

Cropland

- These soils are not suited to cropland.
- Crops are grown because of frequent flooding.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the hazard of flooding, this soil is not suited to building site development.
- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- These soils are not suited to septic tank absorption fields.
- The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Floodwaters may damage some components of septic systems.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

TuD—Trawick gravelly clay loam, 5 to 15 percent slopes

Map Unit Composition

Major components:
Trawick and similar soils: 80 percent

Contrasting inclusions:
Bub soils: 5 percent
Hannahatchee soils: 5 percent
Tuscosso soils: 5 percent
Tenaha soils: 5 percent

Component Descriptions

Trawick

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from glauconitic sandstone
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)
Available water capacity: Low (about 5.4 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Medium
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 6 inches; dark brown gravelly clay loam; moderately acid

Subsoil
6 to 24 inches; dark red clay; strongly acid
24 to 41 inches; red clay loam; strongly acid

Substratum layer
41 to 80 inches; strong brown bedrock; very strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks, and restricts the use of some mechanical planting equipment.

- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines; seepage of poorly treated effluent is a concern.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, designing local roads and streets is difficult.

TuG—Trawick clay loam, 15 to 35 percent slopes

Map Unit Composition

Major components:
Trawick and similar soils: 80 percent

Contrasting inclusions:
Bub soils: 10 percent
Tenaha soils: 5 percent
Tuscosso soils: 5 percent

Component Descriptions

Trawick

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from glauconitic sandstone
Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Slowest soil permeability: Moderately slow (about 0.2 in/hr)

Available water capacity: Low (about 5.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: High
Non-irrigated land capability: 6e

Typical Profile

Surface layer
0 to 3 inches; dark reddish brown clay loam; moderately acid

Subsoil
3 to 20 inches; reddish brown clay; strongly acid
20 to 32 inches; reddish brown and yellowish brown clay; strongly acid
32 to 37 inches; yellowish brown clay; strongly acid

Substratum layer
37 to 80 inches; yellowish brown bedrock; strongly acid

Use and Management

Cropland
- These soils are not suited to cropland.

Pastureland
- This soil provides poor summer pasture. Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Using a system of seedbed preparation that minimizes soil disturbance when pastures are renovated conserves soil moisture.

Woodland
- The hazard of erosion is accelerated if the soil is disturbed.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings, creates unsafe operating conditions, reduces the operating efficiency of log trucks, creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment, and restricts the use of equipment for preparing this site for planting and seeding.
- The slope may restrict the use of some mechanical planting equipment.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The high content of clay in the soil below the surface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the steep slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- This soil is poorly suited to use as base material for local roads and streets because of the moderate shrink-swell potential.
- The low bearing strength of this soil is not suitable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Because of the steep slope, special design of local roads and streets is needed.

W—Water

These are areas of water, either natural or man-made.

WeB—Woden fine sandy loam, 0 to 4 percent slopes

Map Unit Composition

Major components:
Woden and similar soils: 80 percent

Contrasting inclusions:
Alazan soils: 10 percent
Bernaldo soils: 5 percent
Mollville soils: 5 percent

Component Descriptions

Woden

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium
Slope: 0 to 4 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Well drained
Slowest soil permeability: Moderately rapid (about 2.0 in/hr)
Available water capacity: Moderate (about 8.9 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Depth to seasonal water saturation: Greater than 6 feet
Runoff class: Very low
Non-irrigated land capability: 2e

Typical Profile

Surface layer
0 to 5 inches; brown fine sandy loam; moderately acid

Subsurface layer
5 to 12 inches; light brown fine sandy loam; strongly acid

Subsoil
12 to 17 inches; yellowish red fine sandy loam; strongly acid
17 to 80 inches; red fine sandy loam; strongly acid

Use and Management

Cropland
- All areas are prime farmland.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

Pastureland
- These soils are well suited to pasture.

Woodland
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites
- These soils are well suited to use as building sites.

Septic tank absorption fields
- These soils are well suited to use as a site for septic tank absorption fields.

Local roads and streets
- These soils are well suited to use as a site for local roads and streets.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. In addition, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for rangeland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, and lawns.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both descriptive and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Texas AgriLife Extension Service.

Crops

Soils used as cropland are managed to control water erosion, maintain tilth and fertility, and in some cases, drain off excess water. The major practices used to accomplish these purposes are:

Using crop residue. Leaving crop residue on the soil helps to control water erosion and conserve moisture. Incorporating residue into the soil helps to improve tilth and the available water capacity.

Farming on the contour. Terracing and farming on the contour help to control water erosion. This is beneficial on most soils that have slopes of more than 1 percent.

Using cover crops. Cover crops furnish protective cover after the crop has been harvested and before the next cultivated crop is planted. Some cover crops suitable for most of the soils in the survey area are small grain, vetch, and mixtures of annual grasses and legumes.

Maintaining fertility. Most crops respond well to commercial fertilizer. Where the proper amounts and kinds of fertilizer are applied and proper management is used, soil fertility levels can be maintained.

Information on these soil management practices can be obtained at the local office of the Natural Resources Conservation Service.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in Table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in Table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or Texas AgriLife Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes. Capability classes are listed for each map unit in the section “Detailed Soil Map Units”.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961).

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1, there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated

by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

Prime Farmland and Other Important Farmlands

Table 6 lists the map units in the survey area that are considered prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

For some soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to

acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Pasture Management and Productivity

According to the most recent agricultural census, San Augustine and Sabine Counties have about 29,000 and 30,400 acres of pastureland, respectively. Of this total, about 14,000 in San Augustine, and 23,000 acres in Sabine are comprised of native pasture, and the rest of the acreage is improved pasture. Areas of native pasture are covered with plants that commonly reseed naturally. Typical native pastures in this region require brush management to yield optimum forage. Common grasses in these pastures vary with types of soils. On the bottomland soils, natural grasses growing include carpetgrass, dallisgrass, vaseygrass, and various sedges. The loamy uplands may be dominated by various bluestem, such as broomsedge and pinehill. Overgrazed sandy uplands may be covered with broomsedge bluestem, needlegrass, and burgrass.

Several different plants have been introduced in an area of improved pasture. Improved bermudagrass, such as coastal, Alicia, Jiggs, and Tifton 85 has greatly increased the yields that can be expected on most soils. The ability to utilize nursery plots for propagation by tops has made Alicia, Jiggs, and Tifton 85 popular varieties for establishment. On wetter bottomland soils, bahiagrass or fescue may offer the highest yield. In some cases, lovegrass may be better suited on very sandy soils. For grazing, many areas of improved pasture are overseeded with legumes. On wetter bottomland soils, white clover is best suited. Crimson clover, arrowleaf clover, or vetch is better suited on most upland soils. On droughty course sandy soils vetch is the clover of choice. By utilizing a legume within a warm season pasture, grazing periods can be extended throughout the year increasing forage quality and production. Legumes provide forage during the dormant season. Properly inoculated legumes correct nitrogen levels, reducing the need for commercial nitrogen fertilizers. Livestock grazing pasture without the use of cool season forages often require supplemental hay or protein sources during the dormant season.

Proper pasture management is necessary on all soils to meet high forage production yields. In east Texas, brush will infest all areas if it is not removed by shredding or chemical applications. Areas of improved pasture can be severely damaged if overgrazed. Management practices such as using proper stocking rates for the type of forage being utilized, along with rotational grazing can reduce overgrazing. Liming and fertilization are also necessary if high yields are to be expected. Nutrients can be supplied utilizing sources such as commercial fertilizers, poultry litter, various animal manures, or by the use of legumes.

Pasture Management Groups

The soils in San Augustine and Sabine Counties have been grouped according to their suitability for pasture management. There are 14 groups of soil suited to pasture management and one group not suited to pasture management. Each group is made up of soils with similar properties and that respond to similar management practices. The landscape position and chemical and physical properties of the soils were considered in assigning soils to each group. Also explained in each group are yields, management problems, and plant adaptability that can be expected in areas of improved pasture. For example, Dreka and Mattex soils are poorly suited to the production of grasses and legumes under normal conditions. This means that in a natural state, without drainage

and flooding protection, land users will have difficulty establishing improved grasses on these soils. However, these same soils may do well in areas of native pasture.

The term "animal unit months" is used to describe the production that might be expected. Proper management is necessary if high yields are expected. An animal unit month is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

For example, eight animal unit months will feed a 1,000-pound animal for eight months. Five months of this time may be from grazing, and three months may be from hay harvested from the same acre in a normal year.

Pasture Management Group 1. This group includes soil mapping units: AaB—Alazan fine sandy loam, 0 to 2 percent slopes; AbA—Alazan-Besner complex, 0 to 2 percent slopes; AtB—Attoyac fine sandy loam, 0 to 4 percent slopes; BaB—Bernaldo fine sandy loam, 0 to 3 percent slopes; BeA—Besner fine sandy loam, 0 to 3 percent slopes; the Latex part of ElA—Eastwood-Latex complex, 1 to 3 percent slopes, mounded; GaA—Gallime-Alazan complex, 0 to 2 percent slopes; the Gallime part of GaC—Gallime-Guyton complex, 0 to 2 percent slopes; the Sawtown part of GuA—Guyton-Sawtown complex, mounded; LdB—Latex fine sandy loam, 1 to 3 percent slopes; the Sawtown part of MiS—Metcalf-Sawtown complex, 0 to 2 percent slopes; SeB—Sawlit fine sandy loam, 0 to 3 percent slopes; SfA—Sawtown very fine sandy loam, 0 to 2 percent slopes; and WeB—Woden fine sandy loam, 0 to 4 percent slopes.

These nearly level and very gently sloping soils are on stream terraces and marine terraces. They have a loamy surface layer, loamy subsoil, and are moderately well drained and well drained.

These soils have no major limitations for use as a pasture and are very well suited to the production of grasses and legumes. Minor limitations of acidity and inadequate fertility are easily corrected with additions of lime and fertilizer.

Adapted grasses on these soils used for forage production include improved bermudagrass and bahiagrass, which can be overseeded with legumes, such as crimson clover, white Dutch clover, arrowleaf clover, or vetch. With proper management, including liming, fertilizing, and rotational grazing, improved bermudagrass will produce about nine animal unit months of grazing and hay in a normal year.

Pasture Management Group 2. This group includes soil mapping units: Hc—Hannahatchee loam, 0 to 1 percent slopes, occasionally flooded; Ia—Iulus fine sandy loam, 0 to 1 percent slopes, occasionally flooded; Iu—Iulus fine sandy loam, 0 to 1 percent slopes, frequently flooded; La—Laneville loam, 0 to 1 percent slopes, occasionally flooded; Lb—Laneville loam, 0 to 1 percent slopes, frequently flooded; the Iulus part of Mi—Mattex-Iulus complex, 0 to 1 percent slopes, frequently flooded; Ow—Owentown fine sandy loam, occasionally flooded; and Tu—Tuscosso loam, 0 to 1 percent slopes, frequently flooded.

These nearly level soils are on broad flood plains of smaller streams. They have loamy surface layers, loamy subsoil and clayey subsoil, are well drained and moderately well drained, and may flood annually.

These soils are very well suited to the production of grasses and legumes. Flooding and slight wetness in some years may interfere with establishment, maintenance, and harvesting of the forage produced.

Adapted grasses on these soils used for forage production include improved bermudagrass, fescue, and bahiagrass, which can be overseeded with legumes, such as crimson clover, white clover, or vetch. With proper management, including liming, fertilizing, and rotational grazing, improved bermuda, fescue or bahiagrass will produce about nine animal unit months of grazing and hay in a normal year.

Pasture Management Group 3. This group includes soil mapping unit: AuD—Austonio fine sandy loam, 5 to 12 percent slopes.

This moderately sloping to moderately steep soil is on stream terraces. It has a loamy surface layer; a loamy subsoil, and is well drained.

This soil is very well suited to the production of grasses and legumes. As slopes increase, water runoff increases and less water is able to enter the root zone and be stored for plant production. Increased slopes also increase the hazard of excessive erosion during pasture establishment or renovation or if the pasture is overgrazed.

Adapted grasses on these soils used for forage production include improved bermudagrass and bahiagrass, which can be overseeded with legumes, such as crimson clover or vetch. With proper management, including liming, fertilizing, and rotational grazing, improved bermudagrass will produce about eight animal unit months of grazing and hay in a normal year.

Pasture Management Group 4. This group includes soil mapping units: BoC—Bowie fine sandy loam, 1 to 5 percent slopes; KuB—Kurth fine sandy loam, 1 to 3 percent slopes; LnB—Lovelady loamy fine sand, 1 to 5 percent slopes; LnD—Lovelady loamy fine sand, 5 to 8 percent slopes; and SmB—Smithdale sandy loam, 1 to 5 percent slopes.

These very gently sloping soils are on interfluves. They have a loamy surface layer, loamy subsoil, and are well drained.

These soils have no major limitations for use as pasture and are well suited to the production of grasses and legumes. However, a moderate capacity to store water slightly lowers potential forage production. Minor limitations of soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer.

Adapted grasses on these soils used for forage production include improved bermudagrass and bahiagrass, which can be overseeded with legumes, such as crimson clover or vetch. With proper management, including liming, fertilizing, and rotational grazing, improved bermudagrass will produce about nine animal unit months of grazing and hay in a normal year.

Pasture Management group 5. This group includes soil mapping units: HaA—Hainesville loamy fine sand, 0 to 2 percent slopes; and RnB—Rentzel loamy fine sand, 0 to 5 percent slopes.

These nearly level and very gently sloping soils are on concave lower slopes, uplands, and stream terraces. They have sandy surfaces layers, loamy or sandy subsoil and are somewhat excessively drained and moderately well drained.

These soils have no major limitations for pasture and moderately well suited to the production of grasses and legumes. Production is limited because of the thick, sandy surface layer allowing rapid movement of water into and nutrients through the plant root zone. This results in low inherent soil fertility and limited water storage available for plant production. Minor limitations of soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer. Slightly wet conditions during the winter and early spring may interfere with harvesting hay, grazing rotation, or using equipment.

Adapted grasses on these soils used for forage production include weeping lovegrass and improved bermudagrass, which can be overseeded with legumes, such as vetch. With proper management, including liming, split applications of fertilizer, and rotational grazing, improved bermudagrass will produce about seven animal unit months of grazing and hay in a normal year.

Pasture Management Group 6. This group includes soil mapping units: BfA—Betis loamy fine sand, 0 to 8 percent slopes; DaC—Darco loamy fine sand, 1 to 8 percent slopes; GrB—Grapeland loamy fine sand, 1 to 5 percent slopes; LiB—Letney loamy sand, 1 to 5 percent slopes; LiC—Lilbert loamy fine sand, 1 to 5 percent slopes (fig. 4); and TnB—Tenaha loamy fine sand, 1 to 5 percent slopes.

These gently sloping to moderately sloping soils are on broad interstream divides on uplands. Most of these soils have a thick, sandy surface layer; a loamy subsoil, and others are deep sands; they range from well drained to somewhat excessively drained.

These soils are moderately well suited to the production of grasses and legumes. Production is limited because of the sandy surface layer allowing rapid movement of water and nutrients through the plant root zone. This results in low inherent soil fertility and limited water storage available for plant production.

Figure 4.—Round bales of coastal bermudagrass grown for hay on an area of Lilbert loamy fine sand, 1 to 5 percent slopes. Lilbert soils are in Pasture Management Group 6.

Adapted grasses on these soils used for forage production include weeping lovegrass and improved bermudagrass, which can be overseeded with legumes such as vetch. With proper management, including liming, fertilizing, and rotational grazing, improved bermudagrass will produce about seven animal unit months of grazing and hay in a normal year.

Pasture Management Group 7. This group includes soil mapping units: AtA—Alto clay loam, 1 to 3 percent slopes; ChA—Chireno clay loam, 0 to 2 percent slopes; NeB—Nacogdoches fine sandy loam, 1 to 5 percent slopes; and NeE—Nacogdoches clay loam, 1 to 5 percent slopes.

These Redland soils are gently sloping soils are on broad interstream divides on uplands. They have a loamy surface layer, a clayey subsoil, and are well drained and moderately well drained.

These soils are moderately well suited to the production of grasses and legumes. Production is decreased slightly because of the clayey subsoil, which limits water intake and storage to plant production. Minor limitations of soil acidity and inadequate fertility are easily corrected with addition of lime and fertilizer.

Adapted grasses on these soils used for forage production include improved bermudagrass and bahiagrass, which can be overseeded with legumes such as crimson clover or vetch. With proper management, fertilizing, and rotational grazing, improved bermudagrass will produce about eight animal unit months of grazing and hay in a normal year.

Pasture Management Group 8. This group includes soil mapping units: BuB—Bub clay loam, 2 to 5 percent slopes; CoB—Corrigan fine sandy loam, 1 to 5 percent slopes; EeB—Eastwood very fine sandy loam, 1 to 5 percent slopes; the Eastwood part of ElA—Eastwood-Latex complex, 1 to 3 percent slopes, mounded; EtB—Etoile loam, 1 to 5 percent slopes; HeB—Herty loam, 0 to 3 percent slopes; KhB—Kirvin fine sandy loam, 1

to 5 percent slopes; KiC—Kirvin gravelly fine sandy loam, 1 to 5 percent slopes; LaB—LaCerda clay loam, 0 to 5 percent slopes; MhC—Meth fine sandy loam, 1 to 5 percent slopes; MsB—Moswell loam, 1 to 5 percent slopes; NaB—Naclina clay loam, 1 to 5 percent slopes; RkB—Raylake clay, 1 to 5 percent slopes; and SaB—Sacul fine sandy loam, 1 to 5 percent slopes.

These gently sloping to moderately sloping soils are on broad interstream divides on uplands. They have a loamy or clayey surface layer and clayey subsoil; they are well drained and are moderately well drained.

These soils are moderately well suited to the production of grasses and legumes. Production is decreased slightly because of the clayey subsoil, which limits water intake and storage to plant production. Minor limitations of soil acidity and inadequate fertility are easily corrected with addition of lime and fertilizer.

Adapted grasses on these soils used for forage production include improved bermudagrass and bahiagrass, which can be overseeded with legumes such as crimson clover or vetch. With proper management, including liming, fertilizing, and rotational grazing, improved bermudagrass will produce about six animal unit months of grazing and hay in a normal year.

Pasture Management Group 9. This group includes soil mapping units: DaE—Darco loamy fine sand, 8 to 15 percent slopes; LiD—Letney loamy sand, 5 to 15 percent slopes; TeD—Tehran loamy sand, 5 to 15 percent slopes; and TnD—Tenaha loamy fine sand, 5 to 15 percent slopes.

These strongly sloping to moderately steep soils are on broad interstream divides on uplands. They have a thick sandy surface layer, loamy subsoil, and are excessively drained and well drained.

These soils are moderately well suited to the production of grasses and legumes. Production is limited because of sandy surface layer allowing rapid movement of water and nutrient through the plant root zone. This results in low inherent fertility and limited water storage available for plant production. Also, as slope increases above 10 percent, equipment use is impaired because of loose, sandy surface.

Adapted grasses on these soils used for forage production include weeping lovegrass and improved bermudagrass, which can be overseeded with legumes such as vetch. With proper management, including liming, fertilizing, and rotational grazing, improved bermudagrass will produce about six animal unit months of grazing and hay in a normal year.

Pasture Management Group 10. This group includes soil mapping units: CtE—Cuthbert fine sandy loam, 5 to 15 percent slopes; CuE—Cuthbert gravelly fine sandy loam, 5 to 15 percent slopes, EeD—Eastwood very fine sandy loam, 5 to 15 percent slopes; EtD—Etoile fine sandy loam, 5 to 15 percent slopes; KkD—Kisatchie loam, 5 to 15 percent slopes; LaE—LaCerda clay loam, 5 to 15 percent slopes; MsD—Moswell loam, 5 to 15 percent slopes; NaD—Naclina clay, 5 to 15 percent slopes; RaD—Rayburn loam, 5 to 15 percent slopes; RkD—Raylake clay loam, 5 to 15 percent slopes; RsD—Rosenwall fine sandy loam, 5 to 15 percent slopes; and TuD—Trawick gravelly clay loam, 5 to 15 percent slopes.

These strongly sloping to moderately steep soils are on broad interstream divides on uplands. They have a loamy surface layer, clayey subsoil, and are moderately well drained.

These soils are moderately well suited to the production of grasses and legumes. Production is limited because of clayey subsoil, which limits water intake and storage for plant production. Also, as slope increases above 10 percent, water runoff increases and less water is able to enter the root zone and be stored for plant production. Increased slope also increases the hazard of excessive erosion during pasture establishment or renovation or if the pasture is overgrazed.

Adapted grasses on these soils used for forage production include improved bermudagrass and bahiagrass, which can be overseeded with legumes such as crimson clover or vetch. With proper management, including liming, fertilizing, and rotational

grazing, improved bermudagrass will produce about six animal unit months of grazing and hay in a normal year.

Pasture Management Group 11. This group includes soils mapping units: TsB—Tonkawa fine sand, 0 to 8 percent slopes; and TsD—Tonkawa fine sand, 8 to 15 percent slopes.

These gently sloping to strongly sloping soils are on broad interstream divides on uplands. They have a sandy texture to more than 80 inches and are somewhat excessively drained. These soils are moderately well suited to the production of grasses and legumes. Production is limited because of sandy surface layer allowing rapid movement of water and nutrients through the plant root zone. This results in low inherent fertility and limited water storage available for plant production. Also, as slope increases above 10 percent, equipment use is impaired because of loose, sandy surface.

Adapted grasses on these soils used for forage production include weeping lovegrass and improved bermudagrass, which can be overseeded with legumes such as vetch. With proper management, including liming, fertilizing, and rotational grazing, improved bermudagrass will produce about three animal unit months of grazing and hay in a normal year.

Pasture Management Group 12. This group includes soil mapping units: GtA—Guyton silt loam, 0 to 1 percent slopes; the Guyton part of GuA—Guyton-Sawtown complex, mounded; and the Mollville part of MpA—Mollville-Besner complex, 0 to 1 percent slopes, mounded.

These nearly level soils are in depression on broad moundy stream terraces. They have a loamy surface layer, loamy subsoil, are poorly drained, and may have water ponded on the surface during late winter and early spring.

These soils are poorly suited to the production of grasses and legumes. Production is limited because of severe wetness, and water ponding on the surface, and poor internal soil drainage. The extreme wetness also interferes with establishment, maintenance, and harvesting of the forage produced.

Adapted grasses on these soils used for forage production include fescue and bahiagrass, which can be overseeded with legumes, such as white clover or vetch. With proper management, including liming, fertilizing, and rotational grazing, fescue or bahiagrass will produce about two animal unit months of grazing and hay in a normal year.

Pasture Management Group 13. This group includes soil mapping units: DsA—Dreka loam, frequently flooded; Mf—Mattex clay loam, 0 to 1 percent slopes, frequently flooded; and the Mattex part of Mi—Mattex-Iulus complex, 0 to 1 percent slopes, frequently flooded.

These nearly level soils are on broad flood plains of large streams. They have a loamy and clayey surface layers, a loamy and clayey subsoil, are somewhat poorly drained, and may be flooded annually.

These soils are poorly suited to the production of grasses and legumes. Production is limited because of severe wetness, and water ponding on the surface, flooding, and poor internal soil drainage. The extreme wetness also interferes with establishment, maintenance, and harvesting of the forage produced.

Adapted grasses on these soils used for forage production include fescue and bahiagrass, which can be overseeded with legumes, such as white clover or vetch. With proper management, including liming, fertilizing, and rotational grazing, fescue or bahiagrass will produce about three animal unit months of grazing and hay in a normal year.

Pasture Management Group 14. This group includes soil mapping units: CrG—Cuthbert soils, 5 to 15 percent slopes, graded; and KiD—Kirvin soils, 2 to 8 percent slopes, graded

These gently sloping to sloping soils are on broad interstream divides on uplands. The gravelly surface layer and the upper subsoil have been removed from these soils. The resulting surface is loamy to clayey with small piles of gravelly material left on the surface. These soils are well drained.

These soils are very poorly suited to the production of grasses and legumes. Production is decreased because of the exposed clayey subsoil, which limits water intake and storage for plant production. For a few years after the surface has been removed, it is difficult to established pasture grasses because of droughty surface layer. Minor limitations of acidity and inadequate fertility are easily corrected with the additions of lime and fertilizer. The surface may have rills or small gullies, which will hamper harvesting.

Adapted grasses on these soils used for forage production include improved bermudagrass and bahiagrass, which can be overseeded with legumes, such as crimson clover or vetch. With proper management, including liming fertilizing, and rotational grazing, improved bermudagrass will produce about one animal unit month of grazing and hay in normal year. On some areas, it may be necessary to plant lovegrass until soil tilt is replaced.

Not suited to pasture. This group includes soil mapping units: CtG—Cuthbert fine sandy loam, 15 to 35 percent slopes; CtS—Cuthbert gravelly fine sandy loam, 15 to 35 percent slopes, stony; MaG—Maben fine sandy loam, 15 to 35 percent slopes; TnG—Tenaha loamy fine sand, 15 to 35 percent slopes; and TuG—Trawick clay loam, 15 to 35 percent slopes.

This group includes soils that in their natural state are not suited to pasture management. These soils are too steep to operate farm machinery in a safe manner.

Woodland and Forest Productivity and Management

The tables in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forest management.

Woodland Productivity

San Augustine and Sabine Counties has about 357,700 acres of woodland of which 31 percent is classified as pine, 21 percent is classified as pine/hardwood, and 48 percent is classified as hardwood. In addition to producing commercial wood products, recreational opportunities and important wildlife habitat are provided. By far, the largest owner group is the non-industrial, private landowner who owns 208,638 acres. Large industrial landowners own about 61,300 acres, and the United States Forest Service owns 67,762 acres and local governments own the remaining acreage of woodland.

Timber products are a major source of income for the county. Lumber, pulpwood, crossties, pallet material, stakes, and crates are manufactured from the timber produced.

Plant habitats in San Augustine and Sabine Counties range from droughty, sandy sites to frequently flooded bottomlands. The plant communities, therefore, range from shortleaf pines and sandjack oak types to willow oak, green ash, and sweetgum types. The major forest management problem in the county is the harvesting of timber without adequate reforestation follow-up.

Woodland Management Groups

The soils in San Augustine and Sabine Counties that are suitable for wood crops have been placed in 23 groups according to their suitability for woodland management. Each group is made up of soils with similar properties and that respond to similar management practices. The landscape position and chemical and physical properties of the soils were considered in assigning soils to each group.

Woodland Management Group 1. This group includes soil mapping unit: Ow—Owentown fine sandy loam, occasionally flooded. This loamy soil is on small flood plains and may be flooded for brief periods. This soil is suited to the production of both pine and hardwood trees.

Common trees of the overstory are loblolly pine, green ash, sweetgum, white oak, water oak, and cherrybark oak. The site index for loblolly pine, sweetgum, and bottomland oaks averages 100 feet. The yield from an unmanaged natural stand of loblolly pine, over a 50-year period, is approximately 430 board feet per acre per year. The yield for sweetgum is approximately 310 board feet per acre per year. Although management can substantially increase these yields, it should also include attention to streamside management zone practices to protect water quality.

Harvesting or management operations may be temporarily interrupted because of brief periods of flooding, but this should cause no difficulty in long-range operations. Since areas of these soils may often be included in streamside management zones, road and trail construction should be limited.

Woodland Management Group 2. This group includes soil mapping units: Hc—Hannahatchee loam, 0 to 1 percent slopes, occasionally flooded; Ia—Iulus fine sandy loam, 0 to 1 percent slopes, occasionally flooded; Iu—Iulus fine sandy loam, 0 to 1 percent slopes, frequently flooded; La—Laneville loam, 0 to 1 percent slopes, occasionally flooded; Lb—Laneville loam, 0 to 1 percent slopes, frequently flooded; the Iulus part of Mi—Mattex-Iulus complex, 0 to 1 percent slopes, frequently flooded; and Tu—Tuscosso loam, 0 to 1 percent slopes, frequently flooded. These loamy soils are on flood plains. They have a high water table during the winter and spring months and may also be flooded for brief durations during the same periods. They are suited to the production of both pine and hardwood trees.

Common trees of the overstory are loblolly pine, water oak, cherrybark oak, white ash, and sweetgum. The site index for loblolly pine and sweetgum averages 100 feet, but can range from 95 to over 110 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 430 board feet per acre per year. The yield for sweetgum is approximately 310 board feet per acre per year. Although management can substantially increase these yields, it should also include attention to streamside management zone practices to protect water quality.

Flooding and a high water table may restrict access for periods during the winter and spring months. Modified equipment, such as tandem-axled and four-wheel drive vehicles, may be needed for much of the year. Control of invading brush and undesirable species may be needed in regeneration operations. Since areas of these soils may often be included in streamside management zones, road and trail construction should be limited.

Woodland Management Group 3. This group includes soil mapping units: the Besner part of AbA—Alazan-Besner complex, 0 to 2 percent slopes; AtB—Attoyac fine sandy loam, 0 to 4 percent slopes; BaB—Bernaldo fine sandy loam, 0 to 3 percent slopes; BeA—Besner fine sandy loam, 0 to 3 percent slopes; the Gallime part of GaA—Gallime-Alazan complex, 0 to 2 percent slopes; GaB—Gallime very fine sandy loam, 1 to 3 percent slopes; the Gallime part of GaC—Gallime-Guyton complex, 0 to 2 percent slopes; the Sawtown part of GuA—Guyton-Sawtown complex, mounded; the Sawtown part of MiS—Metcalf-Sawtown complex, 0 to 2 percent slopes; the Besner part of MpA—Mollville-Besner complex, 0 to 1 percent slopes; SfA—Sawtown very fine sandy loam, 0 to 2 percent slopes; and WeB—Woden fine sandy loam, 0 to 4 percent slopes. These loamy soils are on stream terraces and are suited to the production of both pine and hardwood trees.

Common trees of the overstory are loblolly pine, shortleaf pine, sweetgum, southern red oak, water oak, and white oak. The site index for loblolly pine averages 95 feet, but can range from 90 to over 100 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 380 board feet per acre per year. The yield for sweetgum is approximately 260 board feet per acre per year. Management can substantially increase these yields.

There are no significant management problems associated with these soils except when they occur in complexes with the wetter Guyton, Metcalf, and Mollville soils.

Woodland Management Group 4. This group includes soil mapping unit: HaA—Hainesville loamy fine sand, 0 to 2 percent slopes. This sandy soil is on stream terraces and best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, sweetgum, southern red oak, and white ash. The site index for loblolly pine averages 95 feet, but can range from 90 to 105 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 380 board feet per acre per year. Management can substantially increase this yield.

The coarse texture of these soils may cause severe problems with equipment use, especially during dry periods. Modified equipment, such as tandem-axled, four-wheel drive, and wide-tired vehicles, may be needed during dry periods. Successful establishment of planted pine requires attention to proper planting depth and soil compaction. Planting when the soil is moist should be helpful. Control of herbaceous weeds, either during site preparation or as a release during the first growing season, may also be needed.

Woodland Management Group 5. This group includes soil mapping units: DsA—Dreka loam, frequently flooded; Mf—Mattex clay loam, 0 to 1 percent slopes, frequently flooded; the Mattex part of Mi—Mattex-Iulus complex, 0 to 1 percent slopes, frequently flooded; and PoA—Pophers silt loam, 0 to 1 percent slopes, frequently flooded. These loamy soils are on broad flood plains and may be flooded for brief to long periods during the winter and spring months. They are best suited to the production of hardwood trees.

Common trees of the overstory are willow oak, cherrybark oak, green ash, American elm, and sweetgum. The site index for sweetgum averages 95 feet. The yield from an unmanaged, natural stand of sweetgum, over a 50-year period, is approximately 260 board feet per acre per year. Although management can substantially increase this yield, it should also include attention to streamside management zone practices to protect water quality.

Wetness greatly restricts access for much of the year. Specialized equipment and harvesting techniques are needed. Control of undesirable, shade-tolerant species is necessary in regeneration efforts. Since areas of these soils may often be included in streamside management zones, road and trail construction should be limited.

Woodland Management Group 6. This group includes soil mapping units: AtA—Alto clay loam, 1 to 3 percent slopes; AuD—Austonio fine sandy loam, 5 to 12 percent slopes; BoC—Bowie fine sandy loam, 1 to 5 percent slopes; the Latex part of ElA—Eastwood-Latex complex, 1 to 3 percent slopes, mounded; KuB—Kurth fine sandy loam, 1 to 3 percent slopes; LdB—Latex fine sandy loam, 1 to 3 percent slopes; the Kurth part of PeC—Penning-Kurth complex, 0 to 2 percent slopes; and SmB—Smithdale sandy loam, 1 to 5 percent slopes. These loamy soils are on marine terraces. They are suited to the production of both pine and hardwood trees.

Common trees of the overstory are loblolly pine, shortleaf pine, sweetgum, southern red oak, water oak, and white oak. The site index for loblolly pine and sweetgum averages 90 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 330 board feet per acre per year. The yield for sweetgum is approximately 210 board feet per acre per year. Management can substantially increase these yields.

There are no significant management problems associated with these soils. During road design and layout, attention should be given to avoid extremely flat or depressional areas, and areas of the steeper sloped Austonio soils.

Woodland Management Group 7. This group includes soil mapping units: AaB—Alazan fine sandy loam, 0 to 2 percent slopes; the Alazan part of AbA—Alazan-Besner complex, 0 to 2 percent slopes; the Alazan part of GaA—Gallime-Alazan complex, 0 to 2 percent slopes; KwA—Kawah fine sand, 0 to 2 percent slopes; the Penning part of PeC—Penning-Kurth complex, 0 to 2 percent slopes; and RnB—Rentzel loamy fine sand, 0 to 5 percent slopes. These soils occur on broad, mounded terraces and low uplands. These soils have high water tables during the winter months. These soils are suited to the production of both pine and hardwood trees.

Common trees of the overstory are loblolly pine, shortleaf pine, sweetgum, water oak, willow oak, southern red oak, and white oak. The site index for loblolly pine and sweetgum averages 93 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 350 board feet per acre per year. The yield for sweetgum is approximately 260 board feet per acre per year. Management can substantially increase these yields.

Some restriction of equipment use can be expected during the winter months because of a high water table. Care must be taken to prevent excessive rutting, especially on the flatter slopes. The abundant available moisture can lead to a competition problem for new pine seedlings. Site preparation or release that will control invading brush may be necessary. During road design and layout, attention should be given to avoid extremely flat or depressional areas and to not interrupt normal drainage. Maintenance will be necessary to fill ruts and holes. Since areas of these soils may often be included in streamside management zones, road and trail construction should be limited.

Woodland Management Group 8. This group includes soil mapping units: LiB—Letney loamy sand, 1 to 5 percent slopes; LiC—Lilbert loamy fine sand, 1 to 5 percent slopes; LiD—Letney loamy sand, 5 to 15 percent slopes; LnB—Lovelady loamy fine sand, 1 to 5 percent slopes; and LnD—Lovelady loamy fine sand, 5 to 8 percent slopes. These sandy soils are on uplands and are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, post oak, white ash, sweetgum, and hickory. The site index for loblolly pine averages 90 feet, but can range from 80 to 95 feet depending on slope and slope position. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 330 board feet per acre per year. Management can substantially increase this yield.

The coarse texture of these soils may cause equipment limitations, particularly during dry periods. Modified equipment, such as tandem-axled, four-wheel drive, or wide-tired vehicles may be needed. Also, little available moisture may cause seedling mortality to be significant in dry years. Successful establishment of planted pine requires attention to proper planting depth and soil compaction. Planting when the soil is moist should be helpful. Control of herbaceous weeds, either during site preparation or as a release during the first growing season may also be needed.

Woodland Management Group 9. This group includes soil mapping units: the Metcalf part of MiS—Metcalf-Sawtown complex, 0 to 2 percent slopes; SaB—Sacul fine sandy loam, 1 to 5 percent slopes; SeB—Sawlit fine sandy loam, 0 to 3 percent slopes. These soils are on marine terraces and may be wet during the winter months because of a high water table. They are suited to the production of both pine and hardwood trees.

Common trees of the overstory are loblolly pine, shortleaf pine, sweetgum, water oak, willow oak, southern red oak, and white oak. The site index for loblolly pine and sweetgum averages 90 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 330 board feet per acre per year. The yield for sweetgum is approximately 210 board feet per acre per year.

Restriction of equipment use can be expected during the winter months because of a high water table. Care must be taken to prevent excessive rutting, especially on the flatter slopes. The abundant available moisture can lead to a competition problem for new pine seedlings. Site preparation or release that will control invading brush may be necessary. During road design and layout, attention should be given to avoid extremely flat or depressional areas and to not interrupt normal drainage. Maintenance will be necessary to fill ruts and holes.

Woodland Management Group 10. This group includes soil mapping units: KhB—Kirvin fine sandy loam, 1 to 5 percent slopes; NeB—Nacogdoches fine sandy loam, 1 to 5 percent slopes; MhC—Meth fine sandy loam, 1 to 5 percent slopes; and SmB—Smithdale sandy loam, 1 to 5 percent slopes. These loamy soils are on gently sloping uplands and are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, southern red oak, sweetgum, and hickory. The site index for loblolly pine averages 85 feet, but can range from 80 to 90 feet. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 280 board feet per acre per year. Management can substantially increase this yield.

There are no significant management problems associated with these soils. On the steeper slopes, proper road design and layout that include the use of water-control devices, such as water bars and wing ditches, should be adequate.

Woodland Management Group 11. This group includes soil mapping units: HeB—Herty loam, 0 to 3 percent slopes; LaB—LaCerda clay loam, 0 to 5 percent slopes; LaE—LaCerda clay loam, 5 to 15 percent slopes; MaE—Maben fine sandy loam, 5 to 15 percent slopes; MsB—Moswell loam, 1 to 5 percent slopes; MsD—Moswell loam, 5 to 15 percent slopes; RkB—Raylake clay, 1 to 5 percent slopes; RkD—Raylake clay loam, 5 to 15 percent slopes; RsB—Rosenwall fine sandy loam, 1 to 5 percent slopes; and RsD—Rosenwall fine sandy loam, 5 to 15 percent slopes. These loamy soils are on rolling uplands and are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, white ash, sweetgum, post oak, southern red oak, and white oak. The site index for loblolly pine averages 85 feet, but can vary significantly depending on slope position. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 280 board feet per acre per year. Management can substantially increase this yield.

As slopes increase, the potential for erosion increases. Therefore, care must be taken to avoid excessive uphill and downhill rutting during skidding and hauling. Intensive site preparation should be limited to gentler slopes, and machine tree planting should be done on the contour. Since clay occurs at the surface or within 10 inches of the surface, particular attention must be given to tree planting methods that ensure proper root placement and soil compaction. In some cases, subsoiling before planting may be needed. The clayey subsoil may restrict equipment use during wet weather. During road design, consideration should be given to avoid the steeper slopes. If roads must be built on these slopes, long, uninterrupted grades should be avoided and adequate, water-control devices, such as water bars and dips, should be installed. Care must be taken to empty wing ditches as often as possible, but always onto stable outlets. On the steeper sites, sloughing may be a problem. Cuts and fills should be kept to a minimum, and shaped to as flat a slope as possible. When necessary, seeding problem areas, such as ditches and outlets, should be considered.

Woodland Management Group 12. This group includes soil mapping units: TnB—Tenaha loamy fine sand, 1 to 5 percent slopes; TnD—Tenaha loamy fine sand, 5 to 15 percent slopes; and TnG—Tenaha loamy fine sand, 15 to 35 percent slopes. These sandy soils are on uplands and are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, sweetgum, post oak, southern red oak, and white oak. The site index for loblolly pine averages 85 feet, but can vary depending on slope position. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 280 board feet per acre per year. Management can substantially increase this yield.

Generally, these soils are not very erosive. However, uphill and downhill rutting should be avoided, particularly on the steeper slopes. The coarse texture of these soils may restrict equipment use, particularly during dry periods. Modified equipment, such as tandem-axled, wide-tired, or four-wheel drive vehicles, may be needed, especially during the dry periods. The moderate available water capacity of these soils may result in significant seedling mortality during dry years. Successful establishment of planted pine requires attention to proper planting depth and soil compaction. Planting when the soil is moist should be helpful. Control of herbaceous weeds, either during site preparation or as a release during the first growing season, may also be necessary. As slopes increase, the need for proper road design, including the installation of water-control devices, such

as water bars, becomes more important. Wing ditches should be used as often as possible, but released only onto stable outlets. If roads must be built on the steeper slopes, long uninterrupted grades should be avoided. Revegetating disturbed areas may be needed on the steeper slopes.

Woodland Management Group 13. This group includes soil mapping units: BfA—Betis loamy fine sand, 0 to 8 percent slopes; DaC—Darco loamy fine sand, 1 to 8 percent slopes; DaE—Darco loamy fine sand, 8 to 15 percent slopes; GrB—Grapeland loamy fine sand, 1 to 5 percent slopes; and TeD—Tehran loamy sand, 5 to 15 percent slopes. These sandy soils are on uplands and are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, post oak, and hickory. The site index for loblolly pine averages 85 feet, but can range from 80 to 90 feet depending on slope and slope position. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 280 board feet per acre per year. Management can substantially increase this yield.

Generally, these soils are not very erosive. However, to minimize erosion associated with logging, care must be taken to prevent uphill and downhill rutting during skidding and hauling on the steeper slopes. Machine planting should be done on the contour on the steeper slopes. The coarse texture of these soils may restrict equipment use during dry periods. Modified equipment, such as tandem-axled, four-wheel drive, and wide-tired vehicles, may be needed. Seedling mortality may be significant because of the low available water capacity of these soils. Successful establishment of planted pine requires attention to proper planting depth and soil compaction. Planting when the soil is moist should be helpful. Control of herbaceous weeds, either during site preparation or as a release during the first growing season, may also be needed. Some replanting may be necessary, especially following a particularly dry year. As slopes increase, the need for proper road design and construction becomes more important. Long, uninterrupted grades should be avoided, and water-control devices should be installed. Wing ditches should be used as often as possible, but released only onto stable outlets. Revegetating potential problem areas should be considered.

Woodland Management Group 14. This group includes soil mapping units: EeB—Eastwood very fine sandy loam, 1 to 5 percent slopes; EeD—Eastwood very fine sandy loam, 5 to 15 percent slopes; and the Eastwood part of ElA—Eastwood-Latex complex, 1 to 3 percent slopes, mounded. These loamy soils are on rolling uplands and are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, sweetgum, hickory, post oak, southern red oak, and white oak. The site index for loblolly pine averages 90 feet, but can range from 85 to 95 feet depending on slope position. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 330 board feet per acre per year. Management can substantially increase this yield.

As slopes increase, the potential for erosion increases. Uphill and downhill rutting should be avoided during harvesting. Intensive site preparation should be restricted to the flatter slopes and machine planted on the contour. The clayey subsoil may restrict equipment use during wet periods. Modified equipment, such as four-wheel drive vehicles, may be needed. Rutting should be avoided on the flatter slopes of the Eastwood soils, and temporary restrictions may be needed during wet weather. The clayey subsoil may also cause problems in tree planting. Attention to planting methods is important to assure proper root placement and soil compaction. Subsoiling before machine planting may also improve seedling survival. As slopes increase, proper road design and construction, including the installation of water-control devices, such as water bars, dips, and wing ditches, becomes more important. Long, uninterrupted grades should be avoided. On the steeper sites, sloughing may be a problem. Cuts and fills should be kept to a minimum and shaped to as flat a slope as possible. Revegetating potential problem areas should be considered.

Woodland Management Group 15. This group includes soil mapping units: CtE—Cuthbert fine sandy loam, 5 to 15 percent slopes; CuE—Cuthbert gravelly fine sandy loam, 5 to 15 percent slopes; KiC—Kirvin gravelly fine sandy loam, 1 to 5 percent slopes; NeE—Nacogdoches clay loam, 1 to 5 percent slopes; and TuD—Trawick gravelly clay loam, 5 to 15 percent slopes. These gravelly soils are on rolling uplands and are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, hickory, sweetgum, post oak, southern red oak, and white oak. The site index for loblolly pine averages 80 feet, but can range from 75 to 90 feet depending on slope position. The yield from and unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 230 board feet per acre per year. Management can substantially increase this yield.

As slopes increase, the potential for erosion also increases, particularly when the soil surface is disturbed. Management practices that will cause as little disturbance as possible should be chosen for sites with steeper slopes. On such sites, less intensive site preparation and regeneration methods, such as roller chopping, burning, or underplanting, and deadening, should be considered. Intensive site preparation should be restricted to the flatter slopes. Also, harvesting methods should be modified on the steeper slopes to prevent excessive erosion. Uphill and downhill rutting should be avoided. The clayey subsoil may restrict equipment use, especially during wet periods. Modified equipment, such as four-wheel drive vehicles, may be needed. Attention to planting methods is important to assure proper root placement and soil compaction. Subsoiling on the flatter slopes prior to machine planting may be helpful in getting the proper planting depth. Proper road design and construction becomes important as the slopes increase. Water-control devices, such as water bars, dips, and wing ditches, must be installed on the steeper slopes. Care must be taken to empty these devices only onto stable outlets. Long, uninterrupted grades should be avoided. Seeding problem areas, such as ditches and ditch outlets, as well as other disturbed areas, may be needed.

Woodland Management Group 16. This group includes soil mapping units: CtG—Cuthbert fine sandy loam, 15 to 35 percent slopes; CtS—Cuthbert gravelly fine sandy loam, 15 to 35 percent slopes, stony; MaG—Maben fine sandy loam, 15 to 35 percent slopes; and TuG—Trawick clay loam, 15 to 35 percent slopes. These soils are on very steep uplands and are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, sweetgum, hickory, post oak, southern red oak, and white oak. The site index for loblolly pine averages 80 feet, but can range from 75 to 85 feet depending on slope position. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 230 board feet per acre per year. Management can substantially increase this yield.

The steep slopes of these soils can cause severe equipment limitations and increase the potential for erosion. Harvesting methods need to be adjusted to limit the use of equipment as much as possible. Skidding should either be restricted to selected trails or done on as gentle an uphill grade as possible. Traffic should be excluded or restricted during wet periods. Site preparation and tree planting should cause a minimum of disturbance to the site. Underplanting or hand planting followed by release should be considered. Attention to planting methods is important to assure proper root placement and soil compaction. Because the slopes on these soils exceed the recommended maximum grade for roads, construction should be avoided whenever possible. If this is not possible, adequate water-control devices, such as water bars, dips, and wing ditches, must be installed. Care must be taken to empty these devices only onto stable outlets. Seeding of the road surface may be necessary, but seeding of ditches and outlets, as well as other problem and disturbed areas, should be planned.

Woodland Management Group 17. This group includes soil mapping units: the Guyton part of GaC—Gallime-Guyton complex, 0 to 2 percent slopes; GtA—Guyton silt loam, 0 to 1 percent slopes; the Guyton part of GuA—Guyton-Sawtown complex, mounded; and the Mollville part of MpA—Mollville-Besner complex, 0 to 1 percent slopes.

These loamy soils are on nearly level terraces and may also be in depressional areas. They may be saturated during the winter months and are suited to the production of both pine and hardwood trees.

Common trees of the overstory are loblolly pine, water oak, willow oak, sweetgum, and green ash. The site index for loblolly pine, water oak, and sweetgum averages 80 feet. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period, is approximately 230 board feet per acre per year. The yield for sweetgum is approximately 120 board feet per acre per year. Management can substantially increase these yields.

Wetness during much of the year may greatly restrict the use of equipment. Harvesting should be planned during drier periods, and modified equipment, such as tandem-axled, wide-tired and four-wheel drive vehicles, may be needed most of the time.

Woodland Management Group 18. This group includes soil mapping units: CrG—Cuthbert soils, 5 to 15 percent slopes, graded; and KiD—Kirvin soils, 2 to 8 percent slopes, graded. These soils are on uplands, and the surface layer has been removed for gravel. They are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, post oak, southern red oak, and hickory. The site index for loblolly pine averages 65 feet, but can vary depending on the amount of site disturbance. The yield from an unmanaged, natural stand of loblolly pine, over a 50-year period, is approximately 95 board feet per acre per year.

They do not have of a surface layer and the clayey texture of these soils cause all phases of management to have special concerns. Stabilizing these soils against erosion will often be needed because of sparse vegetation. Seeding may be needed. Since clay may occur at the surface, attention to tree planting methods is important. Subsoiling prior to planting may be required, and attention must be given to root placement and soil compaction. Harvesting methods that will minimize soil disturbance should be planned. The use of equipment may be restricted during wet periods. Roads built on these soils must have adequate water-control devices, such as water bars, dips, and wing ditches, installed. Care must be taken to empty these devices only onto stable outlets, and seeding of outlets and ditches may be necessary.

Woodland Management Group 19. This group includes soil mapping units: TsB—Tonkawa fine sand, 0 to 8 percent slopes; and TsD—Tonkawa fine sand, 8 to 15 percent slopes. These very deep sandy soils are on uplands. They are best suited to the production of pine trees.

Common trees of the overstory are loblolly pine, shortleaf pine, post oak, and hickory. The site index for loblolly pine averages 65 feet, but can vary depending on slope position in steeper areas. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 95 board feet per acre per year. Management can increase this yield.

The coarse texture of these soils causes a severe limitation on equipment use, particularly during dry periods. Modified equipment, such as tandem-axled, four-wheel drive, or wide-tired vehicles, is needed. Generally, erosion is not a severe problem, but it can be when runoff water is confined. Therefore, uphill and downhill rutting must be avoided. Site preparation should be kept to a minimum to maintain as much of the organic matter as possible on the soil surface. Site preparation burning should be avoided. To minimize the impact of site preparation and still achieve control of competing vegetation, the use of herbicides for release should be considered. Control of herbaceous competition during the first growing season may be important to successful seedling establishment. Because these soils are droughty, seedling mortality should be expected to be high and replanting should be planned. Measures, such as planting in furrows plowed on the contour and root treatments with absorbents, may be helpful. These very deep sandy soils cause serious problems in road construction and maintenance. Where possible, permanent roads should be kept to a minimum and constant maintenance should be planned. During road construction, V-shaped ditches should be avoided and

water-control devices must have stable outlets. Temporary roads should be retired after use by reshaping if necessary, revegetating, and restricting access.

Woodland Management Group 20. This group includes soil mapping units: BuB—Bub clay loam, 2 to 5 percent slopes; EtD—Etoile fine sandy loam, 5 to 15 percent slopes; and NaD—Naclina clay, 5 to 15 percent slopes. Although these soils are on steep uplands, the Bub soils are shallow and may have a stony surface. They are best suited to the production of pine trees, but hardwood trees usually dominate the Naclina soils.

Common trees of the overstory are loblolly pine, shortleaf pine, white ash, hickory, southern red oak, post oak, and white oak. The site index for loblolly pine averages 65 feet, but can range from 60 to 75 feet depending on slope and slope position. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 95 board feet per acre per year. Management can increase this yield.

The steep slopes of these soils and the shallow surface of the Bub soils may cause severe equipment limitations and increase the potential for erosion. Harvesting methods need to be adjusted to limit the use of equipment as much as possible. Skidding should either be restricted to selected trails or done on as gentle an uphill grade as possible. Traffic should be excluded or restricted during wet periods. Site preparation and tree planting should be done in ways that cause a minimum of disturbance to the site. Underplanting or hand planting followed by release should be considered. Attention to planting methods is important to assure proper root placement and soil compaction. The stony surface may restrict planting methods on the Bub soils to hand planting. Because the slopes on these soils exceed the recommended maximum grade for roads, construction should be avoided whenever possible. If this is not possible, adequate water-control devices, such as water bars, dips, and wing ditches, must be installed. Care must be taken to ensure that these devices release only onto stable outlets. Seeding of the road surface may be necessary, but seeding of ditches and outlets, as well as other problem and disturbed areas, should be planned.

Woodland Management Group 21. This group includes soil mapping units: ChA—Chireno clay loam, 0 to 2 percent slopes; EtB—Etoile loam, 1 to 5 percent slopes; and NaB—Naclina clay loam, 1 to 5 percent slopes. These clayey soils are on uplands. They are suited to the production of both pine and hardwood trees.

Common trees of the overstory are loblolly pine, shortleaf pine, water oak, southern red oak, and sweetgum. Thorny species, such as hawthorns, dominate the understory. The site index for loblolly pine and sweetgum averages 75 feet. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 180 board feet per acre per year. The yield for sweetgum is approximately 85 board feet per acre per year. Although management can increase these yields, short rotation management systems may be considered because trees growing on these soils tend to have poor form.

The clayey subsoil may restrict equipment use during wet periods. Modified equipment, such as four-wheel drive vehicles, may be needed. The clay may also cause problems in tree planting. Attention to planting methods is important to assure proper root placement and soil compaction. The high shrink-swell nature of these soils makes road construction and maintenance difficult. Long, uninterrupted grades should be avoided. In addition, care must be taken to prevent excessive rutting, especially on the flatter slopes. Road maintenance is necessary to fill ruts, cracks, and holes. Potential problem areas should be revegetated.

Woodland Management Group 22. This group includes soil mapping unit: KkD—Kisatchie loam, 5 to 15 percent slopes. These soils are on uplands and have a moderate potential for woodland (pine) management.

Common trees of the overstory include loblolly and shortleaf pine; post oak, southern red oak, water oak, and white oak; ash; sweetgum; elm; and hickory. Longleaf pine, when within its range, also occurs on some of these soils. The 50-year index for loblolly pine averages 65 feet (approximately 57 feet on a 25-year curve), and ranges from 60 to 75

feet, depending on slope and slope position. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 185 board feet. Management can substantially increase this yield. Access and equipment operability is poor during wet periods.

Wet weather limitations may be necessary to prevent rutting and excessive erosion. Low strength and stickiness make these soils only moderately suited to roads and log landings. On steeper slopes the potential for erosion is greater. On these steeper slopes, site disturbance should be minimized and water control devices for roads, such as water bars, should be installed. Revegetation of roads and log landings may also be necessary. Site preparation and tree planting operations are affected by the sticky nature of these soils when wet. Tree planting should be planned for the drier, early part of the planting season. Also, because clay occurs within ten inches of the surface, care must be taken to assure proper planting depth. Subsoiling or ripping on the flatter slopes, prior to planting, may be needed. On steep slopes, mechanical tree planting should be done on the contour. The moderate level of runoff on these soils means precautions are needed when using herbicides for site preparation and release in order to prevent contamination of surface waters.

Woodland Management Group 23. This group includes soil mapping units: CoB—Corrigan fine sandy loam, 1 to 5 percent slopes; and RaD—Rayburn loam, 5 to 15 percent slopes. This soil is on uplands and has a high potential for woodland (pine) management.

Common trees of the overstory include loblolly, longleaf and shortleaf pine; post oak, southern red oak, and white oak; ash; sweetgum; elm; and hickory. The 50-year site index for loblolly pine averages 85 to 90 feet (approximately 60 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 280 board feet per acre per year.

Access and equipment operability is poor during wet periods. Wet weather limitations may be necessary to prevent rutting and excessive erosion. Low strength and stickiness make these soils only moderately suited to roads and log landings. On steeper slopes the potential for erosion is greater. On these steeper slopes, site disturbance should be minimized and water control devices for roads, such as water bars, should be installed. Revegetation of roads and log landings may also be necessary. Site preparation and tree planting operations are affected by the sticky nature of these soils when wet. Tree planting should be planned for the drier, early part of the planting season. Also, because clay occurs within ten inches of the surface, care must be taken to assure proper planting depth. Subsoiling or ripping on the flatter slopes, prior to planting, may be needed. On steep slopes, mechanical tree planting should be done on the contour. The moderate level of runoff on these soils means precautions are needed when using herbicides for site preparation and release in order to prevent.

Forest Productivity

In Table 7, the *potential productivity* of merchantable or common trees on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and co-dominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as board feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Forest Management

In Table 8, Table 9, Table 10, Table 11, and Table 12, interpretive ratings are given for various aspects of forest management. The ratings are both descriptive and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately well suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified forest management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate*, and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for forest management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

For limitations *affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities; *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

The ratings of suitability *for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings in the column soil *rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, moderate indicates that rutting is likely, and *sever*e indicates that ruts form readily.

Ratings in the column hazard *of off-road or off-trail erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary

climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column hazard *of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of slight indicates that little or no erosion is likely; moderate indicates that some erosion is likely, that the roads or trails may require occasional maintenance; and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column suitability *for roads (natural surface*) are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the columns suitability *for hand planting* and suitability *for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column suitability *for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the column suitability *for mechanical site preparation (surface*) are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column suitability *for mechanical site preparation (deep*) are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Recreation

San Augustine and Sabine counties have the climate, topography, highways, natural resources, lakes, and scenery characteristic of eastern Texas make it highly attractive for hunting, fishing, and other outdoor activities. With their location, they are within easy travel distance of the major population centers of Houston and Dallas/Fort Worth. Fishing, hunting, boating, and camping are major activities in both counties.

Sam Rayburn Reservoir, the largest body of water entirely within the state of Texas, is on the southwestern boundary of San Augustine County, and Toledo Bend Reservoir, even larger but shared by the state of Louisiana, is on the eastern boundary of Sabine County. They each provide great numbers of outdoors enthusiasts each year with boating, camping, fishing, and other activities.

Deer hunting is highly popular in the area and an annual rite for many. The large numbers of feral hogs in the area are the target of many because of their capacity for destroying pastureland as well as being a source of pork. Other species of woodland wildlife are also abundant.

Public areas available for recreation include the Angelina National Forest in San Augustine County, and the Sabine National Forest in Sabine County. Many of the privately-owned and timber company properties throughout the area are leased for hunting and fishing. Use of recreation facilities in the survey area and surrounding counties has greatly increased in the past several years. Many soils are moderately suited to development of recreation facilities.

The soils of the survey area are rated in Table 13 and Table 14 according to limitations that affect their suitability for recreation. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in Table 13 and Table 14 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary

facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a seasonal high water table, ponding, flooding, and texture of the surface layer.

Golf course fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches—the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding,

Wildlife

Prepared in part by Bill Deauman, Wildlife Biologist, NRCS/USDA

Modern day San Augustine and Sabine Counties are known for their beautiful forest and lakes, with a tremendous production of broilers or meat chickens.

Many of the soils in the counties are suitable for small pond construction. Soils are generally fine sandy loam surfaces with subsoils containing sufficient clay for dam building. Ponds and lakes are stocked with largemouth bass, catfish, crappies (white and black perch), and bluegill. Other species found naturally are freshwater drum, flathead catfish, carp, gars, bowfin, buffalo fish, white bass, gizzard and threadfin shad, and various sunfish.

Private water bodies are normally acidic and require liming for optimum fish production. Submerged and floating aquatic plants are a problem in many ponds. Little commercial aquaculture exist in the counties.

The major game species in the area are white-tailed deer, mourning dove, fox and gray squirrels, and ducks. Raccoon, opossum, skunks, armadillo, cottontail rabbit, swamp rabbit, numerous rodents, and songbirds inhabit the counties.

Common furred predators are coyote, red and gray fox, and bobcat. There are numerous species of reptiles and amphibians. Among these are cottonmouth snake, copperhead snake, coral snake, timber rattlesnake, green frog, bullfrog, tree frog, and snapping turtle. The American alligator inhabits some wetlands especially along the Attoyac and Sabine watersheds.

During migration periods, ducks, such as, teal, mallards, gadwall, widgeons, shovelers, pintails and several species of geese use wetlands and fields for feeding, resting, and roosting. Wood ducks are found in the area throughout the year and nest in natural cavities or man-made houses.

In 2006, there were nineteen federally and/or state listed endangered or threatened animal species in the two counties. Included were red-cockaded woodpecker, arctic peregrine falcon, Bachman’s sparrow, bald eagle, swallow-tailed kite, white-faced ibis, wood stork, blue sucker, creek chubsucker, paddlefish, black bear, Louisiana black bear, Rafinesque”s big-eared bat, red wolf, alligator snapping turtle, Louisiana pine snake, northern scarlet snake, Texas horned lizard, and timber/canebrake rattlesnake.

The U.S. Forest Service and some timber companies are propagating the Red-cockaded Woodpecker. Texas Parks and Wildlife has made releases of Eastern turkey in an attempt to restore their populations. The Louisiana black bear is gaining strength in neighboring Louisiana with bears expected to “spill over” into East Texas.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In Table 15, Table 16, Table 17, Table 18, and Table 19, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The ratings in the tables are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the element or kind of habitat. *Not limited* indicates that the soil has features that are very favorable for the element or kind of habitat. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, grain sorghum, wheat, oats, and rye.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are lovegrass, bermudagrass, kleingrass, yellow bluestems, Eastern gamagrass, and switchgrass. Examples of legumes are clover, cowpeas, and vetch.

Upland herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are big bluestem, little bluestem, indiangrass, goldenrod, beggarweed, and grama.

Upland shrubs and vines indicate the limitation of the soils as a growing medium for diverse upland shrub and vine community. This community is adapted to soils that are drier than those common in the moist riparian and wetland zones, but that are not as dry as those in upland desert areas. The soil properties and features that affect the ability of these species to thrive include soil texture, content of organic matter, available water capacity, depth to bedrock or a cemented pan, the presence of excess salts in the soil, soil moisture and temperature regimes, depth to a high water table, and rock fragments on the soil surface. Examples of upland shrubs and vines are yaupon, farkleberry, Hawthorne, greenbriar, poison ivy, jasmine, Virginia creeper, trumpet creeper, and grape.

Upland deciduous trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are post oak, red oak, white oak, sweetgum, hawthorn, dogwood, hickory, dewberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are oak, sweetgum, hawthorne, dogwood, hickory, and dewberry.

U*pland coniferous trees* indicate the limitation of the soils as a growing medium for a diverse upland coniferous tree community that meets specific local habitat requirements for targeted and nontargeted wildlife species. Typically, coniferous trees can subsist under harsher soil conditions than geographically related hardwoods. The soil properties and features that affect the ability of upland coniferous trees to thrive include available water capacity, depth to a high water table, depth to bedrock or a cemented pan, and soil moisture and temperature regimes. Examples of coniferous plants are loblolly pine, long leaf pine, short leaf pine, cedar, and juniper.

Freshwater wetland plants indicate the limitation of the soils as a growing medium for plants that are adapted to wet soil conditions. The soils suitable for this habitat generally are in marshes, in depressions, on bottomland, in backwater areas on flood plains, in drainageways adjacent to streams, in areas of springs and seeps, or in any other area where the soil is not directly affected by moving floodwater but may be ponded during some part of the year. The soil properties and features that affect the ability of freshwater wetland plants to persist include soil texture, content of organic matter, depth to a high water table, the frequency and duration of ponding, the presence of excess salts in the soil, and soil reaction (pH). Examples of freshwater wetland plants are smartweed, wild millet, cattails, cut grass, giant cane, maiden cane, lizard tail, rattle box, sesbania, planer tree, buttonbush, water hickory, rushes, sedges, and reeds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consist of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and herbaceous plants. Wildlife attracted to these areas includes bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consist of areas of deciduous and coniferous plants and associated grasses, legumes, and herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas is ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Hydric Soils

In this section, hydric soils are defined and described.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). The criteria are used to identify a phase of a soil series that normally is also a hydric soil. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2003) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they generally exhibit certain properties that can be observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Others, 1998).

For information regarding hydric soils in the soil survey area, refer to the USDA Natural Resources Conservation Service Soil Data Mart at http://soildatamart.nrcs.usda.gov.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 20 and Table 21 shows the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single—family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is

assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load—supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load—supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches—the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Table 22 and Table 23 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils

are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in down slope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Groundwater contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of groundwater pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Table 24 and Table 25 provides information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In Table 24, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of

thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair*, or *poor* as potential sources of sand and gravel. A rating of good or fair means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair*, or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Water Management

Table 26 provides information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low

maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include physical and chemical properties, and clay mineralogy.

Engineering Properties

Table 27 provides the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters across. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches across and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches across is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection. If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches across and 3 to 10 inches across are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches across based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Soil Properties

Table 28 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle-size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle-sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In Table 19, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle-size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar or 1/10 bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}*)* refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3 bar or 1/10 bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil. Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop resibecause of the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in Table 19 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Soil Properties

Table 29 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter (mmhos/cm) or decisiemens per meter (dS/m) at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can

differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

Table 30 shows estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 30 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 30 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is

unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 31 shows estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restricts roots or otherwise provides an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Physical, Chemical, and Clay Mineralogy Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in Table 32, the results of chemical analysis in Table 33, and the results of clay and sand mineralogy analysis in Table 34. The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by USDA-NRCS, National Soil Survey Laboratory, Lincoln, Nebraska.

Depth to the upper and lower boundaries of each layer is indicated.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters across. Measurements reported as percent or quantity of unit weight was calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (USDA, 1996).

Sand—(0.05- to 2.0-millimeter fraction) weight percentages of material less than 2 millimeters (3A1).

Silt—(0.002- to 0.05-millimeter fraction) pipette extraction, weight percentages of all material less than 2 millimeters (3A1).

Clay—(fraction less than 0.002 millimeters) pipette extraction, weight percentages of material less than 2 millimeters (3A1).

Coefficient of linear extensibility—change in clod dimension based on whole soil (3D4).

Bulk density of less than 2 millimeter material, saran-coated clods field moist (3B1a), 1/3 bar (3B1b), ovendry (3B1c).

Water retained—pressure extraction, percentage of ovendry weight of less than 2 millimeter material; 1/3 bar (3C1), 15 bars (3C2).

Reaction (pH)—1:1 water dilution (4C1a2a1).

Extractable cations—ammonium acetate pH 7.0, ICP; calcium (6N2e, 6N2f), magnesium (6O2d, 6O2e), sodium (6P2b, 6P2c), potassium (6Q2b, 6Q2c).

Cation exchange capacity—sum of cations (4B4b1).

Base saturation—ammonium acetate, pH 7.0 (4B4c1).

Aluminum saturation-Radial Mode (4B3a1a)

*Exchangeable sodium percentage (*ESP*)*—ammonium acetate, pH 8.2 (5F1).

Carbonate, as $CaCO_3$,—Air Dry, <2mm (4E1a1a1a1).

X-Ray diffraction, clay mineralogy—(7A1).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 35 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil—forming processes and the degree of soil formation. Each order is identified by a word ending in sol. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf *Ud* meaning humid, plus *alf,* from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, active, thermic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil that is typical of the series in the survey area is described. Some of the typifying pedons described in the following series descriptions are not exclusively located within the boundaries of San

Augustine and Sabine Counties, but are typical pedons for the series in the MLRA survey area, of which both counties are located. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 2003). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section “Detailed Soil Map Units.”

Alazan Series

MLRA: Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium
Geology: Queen City Sand Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 0 to 2 percent

Associated Soils

Bowie soils have 5 percent plinthite and are on higher positions.
Lilbert soils have sandy surfaces more than 20 inches thick, and are on interfluves.
Tenaha soils have sandy surfaces more than 20 inches thick, and are on side slopes.

Taxonomic Classification

Fine-loamy, siliceous, semiactive, thermic Aquic Glossudalfs

Typical Pedon

Alazan fine sandy loam in an area of Alazan fine sandy loam, 0 to 2 percent slopes, in intermixed conifers and hardwoods; from U.S. Highway 59 and Farm Road 125 (Linden), 4.2 miles southeast on Farm Road 125, 1.4 miles northeast on County Road 1898, and 170 feet northwest in woods. San Augustine West USGS 7.5-minute topographic quadrangle; Latitude: 32 degrees, 58 minutes, 45.09 seconds N.; Longitude: 94 degrees, 16 minutes, 44.32 seconds W.

A—0 to 3 inches; brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; very friable, soft; common fine, common medium, and few coarse roots; strongly acid; clear wavy boundary.

E—3 to 12 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; very friable, soft; few fine, few medium, and few coarse roots; few fine and medium pores; very strongly acid; gradual wavy boundary.

Bt1—12 to 20 inches; brownish yellow (10YR 6/6) loam; moderate medium subangular blocky structure; friable, slightly hard; few medium and few coarse roots; 5 percent faint clay films; 1 percent medium faint yellowish brown (10YR 5/4) masses of oxidized iron; 5 percent medium distinct light brownish gray (10YR 6/2) iron depletions; very strongly acid; gradual wavy boundary.

Bt2—20 to 26 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm, moderately hard; few medium roots; 5 percent faint clay films; 5 percent medium distinct yellowish red (5YR 5/6) masses of oxidized iron; 5 percent medium distinct light brownish gray (10YR 6/2) clay depletions; very strongly acid; gradual wavy boundary.

Bt/E1—26 to 36 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm, moderately hard; few medium roots; 5 percent by volume streaks and pockets of albic material (E); 5 percent faint clay films; 5 percent medium distinct yellowish red (5YR 5/6), and 1 percent medium prominent red (2.5YR 4/6) masses of oxidized iron; 5 percent light brownish gray (10YR 6/2) clay depletions; very strongly acid; gradual irregular boundary.

Bt/E2—36 to 47 inches; brownish yellow (10YR 6/6) clay loam; moderate medium subangular blocky structure; firm, moderately hard; few fine roots; 15 percent by volume streaks and pockets of albic material (E); 5 percent faint clay films; 5 percent coarse distinct strong brown (7.5YR 5/8) masses of oxidized iron; 5 percent medium and coarse distinct yellowish red (5YR 5/8), 5 percent medium distinct strong brown (7.5YR 5/6), and 1 percent fine prominent red (2.5YR 4/6) masses of oxidized iron; 15 percent light brownish gray (10YR 6/2) clay depletions; very strongly acid; gradual irregular boundary.

Bt/E3—47 to 52 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; very firm, moderately hard; 35 percent by volume streaks and pockets of albic material (E); 5 percent faint clay films; 5 percent fine and medium distinct yellowish red (5YR 5/8), and 1 percent fine and medium faint strong brown (7.5YR 5/6) masses of oxidized iron; 35 percent light brownish gray (10YR 6/2) clay depletions; very strongly acid; gradual irregular boundary.

Bt/E4—52 to 60 inches; yellowish brown (10YR 5/6) clay loam; weak fine subangular blocky structure; friable, slightly hard; 40 percent by volume streaks and pockets of albic material (E); 5 percent faint clay films; 5 percent medium distinct strong brown (7.5YR 5/6), and 5 percent medium faint yellowish brown (10YR 5/8) masses of oxidized iron; 40 percent light brownish gray (10YR 6/2) clay depletions; very strongly acid; gradual irregular boundary.

Bt/E5—60 to 75 inches; yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; friable, slightly hard; 45 percent by volume streaks and pockets of albic material (E); 5 percent faint clay films; 5 percent medium distinct yellowish red (5YR 5/8), 1 percent medium prominent dark reddish brown (2.5YR 3/3), and 1 percent fine faint dark yellowish brown (10YR 3/4) masses of oxidized iron; 45 percent light brownish gray (10YR 6/2) clay depletions; very strongly acid; gradual wavy boundary.

Btg/E—75 to 80 inches; light brownish gray (10YR 6/2) clay loam; weak fine subangular blocky structure; friable, slightly hard; 10 percent by volume streaks and pockets of albic material (E); 5 percent faint clay films; 5 percent medium distinct yellowish brown (10YR 5/6), and 1 percent fine prominent yellowish red (5YR 5/8) masses of oxidized iron; 10 percent light brownish gray (10YR 6/2) clay depletions; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.

Mean annual soil temperature: 67 to 70 degrees F

Solum thickness: More than 80 inches

Clay content: 18 to 25 percent

Silt content: 25 to 45 percent
CEC/clay ratio: 0.24 to 0.40
Redoximorphic features: Iron concentrations in shades of red, yellow, or brown, and iron depletions in shades of gray in the subsurface and subsoil

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 to 3
Texture: Very fine sandy loam or fine sandy loam
Rock fragments: Amount—none to few; kind—quartzite; size—pebbles; location—are in some pedons
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E horizon

Hue: 10YR
Value: 5 to 7
Chroma: 2 to 4
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red or brown
Redoximorphic depletions: Amount—none to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray
Texture: Very fine sandy loam or fine sandy loam
Rock fragments: Amount—none to few, kind—quartzite; size—pebbles; location—are in some pedons
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Upper Bt horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 4 to 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray
Texture: Loam or sandy clay loam
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Lower Bt horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 4 to 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray
Texture: Loam, sandy clay loam, or clay loam
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Bt/E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 4 to 8

Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray
Texture: Loam, clay loam, or sandy clay loam in the Bt part; and sandy loam, fine sandy loam, or loam in the E part
Albic materials (E): Make up 5 to 50 percent of the horizon, however, the glossic horizon (with more than 15 percent albic material) is more than 20 inches thick. In most pedons, 5 to 20 percent of the matrix is brittle
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Btg/E horizon (where present)

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 2
Redoximorphic concentrations: Amount—common to many; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red or brown
Redoximorphic depletions: Amount—common to many; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray
Texture: Loam, clay loam, or sandy clay loam in the Bt part; and loam, fine sandy loam, or sandy loam in the E part
Albic materials (E): Make up 5 to 50 percent of the horizon
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Alto Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Saddles on interfluves
Position on landform: Concave or linear areas
Parent material: Loamy residuum weathered from glauconitic sandstone
Geology: Weches Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Deep to densic material
Shrink-swell potential: Moderate
Slope: 1 to 3 percent

Associated Soils

Nacogdoches soils have a solum thicker than 60 inches.
Trawick soils have sola 20 to 40 inches thick to paralithic bedrock.

Taxonomic Classification

Fine-loamy, siliceous, active, thermic Typic Hapludalfs

Typical Pedon

Alto clay loam in an area of Alto clay loam, 1 to 3 percent slopes, in tame pastureland; from the intersection of Texas Highway 21 and U.S. Highway 96 in San Augustine, approximately 2.8 miles west on Texas Highway 21 to intersection with County Road 217, approximately 1.45 miles north on County Road 217, approximately 800 feet west of road in bahiagrass pasture near pond. San Augustine West, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 33 minutes, 11.40 seconds N.; Longitude: 94 degrees, 10 minutes, 25.40 seconds W.

Ap—0 to 7 inches; dark reddish brown (2.5YR 3/4) clay loam; weak medium subangular blocky structure parting to weak fine subangular blocky; firm, hard; common fine, common medium, and few coarse roots; 5 percent ironstone nodules; moderately acid; gradual smooth boundary.

Bt1—7 to 17 inches; dark yellowish brown (10YR 4/4) clay loam; 1 percent fine faint very dark grayish brown (10YR 3/2) mottles; weak fine subangular blocky structure parting to weak medium subangular blocky; firm, hard; common fine, common medium, and few coarse roots; 15 percent patchy clay films; 5 percent ironstone nodules; strongly acid; gradual smooth boundary.

Bt2—17 to 26 inches; dark yellowish brown (10YR 4/6) clay loam; moderate medium subangular blocky structure; firm, hard; few medium roots; few fine and medium pores; 30 percent patchy clay films; 7 percent ironstone nodules; strongly acid; gradual smooth boundary.

Bt3—26 to 41 inches; dark yellowish brown (10YR 4/6) clay loam; moderate medium subangular blocky structure; firm, hard; few medium roots; 30 percent patchy clay films; 5 percent iron-manganese nodules; 2 percent ironstone nodules; strongly acid; gradual smooth boundary.

Bt4—41 to 58 inches; dark yellowish brown (10YR 4/6) clay loam; 5 percent fine and medium prominent yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; firm, hard; 10 percent faint clay films; 10 percent iron-manganese nodules; 10 percent ironstone nodules; moderately acid; gradual smooth boundary.

Cd—58 to 80 inches; dark yellowish brown (10YR 4/6) clay; platy parting to massive; extremely firm, extremely hard; moderately acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 20 to 30 inches
Solum thickness: 50 to 70 inches
Clay content: 25 to 35 percent
Concretions and Ironstone: Amount—2 to 15 percent; size—pebbles, 0.25 to 0.5-inch in diameter, in most pedons
CEC/clay ratio: 0.40 to 0.60

A or Ap horizon

Hue: 2.5YR to 10YR
Value: 3 or 4, horizons with value of 3 are less than 7 inches thick
Chroma: 2 to 4
Texture: Clay loam
Reaction: Moderately acid or slightly acid (5.6 to 6.5)

Upper Bt horizon

Hue: 5YR to 10YR
Value: 4 or 5
Chroma: 4 to 8
Lithochromic mottles: Few to common in shades of red, and few to many in shades of gray and yellow that is weathered glauconitic materials. The weathered glauconitic materials typically increase with depth.
Texture: Clay loam, sandy clay, or clay

Rock fragments: Some pedons have thin discontinuous ironstone or glauconitic ironstone layers and fragments in the lower part with or without fragments of glauconitic greensand
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

Lower Bt horizon

Hue: 5YR to 10YR
Value: 4 or 5
Chroma: 4 to 8
Lithochromic mottles: Few to common in shades of red and few to many in shades of gray and yellow weathered glauconitic materials. The weathered glauconitic materials typically increase with depth.
Texture: Clay loam, sandy clay loam, or loam
Rock fragments: Some pedons have thin discontinuous ironstone or glauconitic ironstone layers and fragments in the lower part with or without fragments of glauconitic greensand
Reaction: Strongly acid to neutral (5.1 to 7.3)

C or Cd horizon

Lithochromic mottles: Weathered glauconitic materials in shades of green, yellow, and brown; shale and marl in shades of gray, brown, and green
Texture: Clay
Effervescence: Very slightly effervescent to strongly effervescent in the shells and marl layers
Reaction: Moderately acid to neutral (5.6 to 7.3); with spots that are slightly alkaline or moderately alkaline (7.4 to 8.4)

Attoyac Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium
Geology: Fluviatile terrace
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 4 percent

Associated Soils

Austonio and Eastwood soils are deep and on side slopes.
Bernaldo and Gallime soils have yellow subsoils.
Besner soils are coarse-loamy.
Hainesville soils are sandy throughout.
Laneville and Iulus soils are on flood plains.
Mollville and Guyton soils are gray throughout.

Taxonomic Classification

Fine-loamy, siliceous, semiactive, thermic Typic Paleudalfs

Typical Pedon

Attoyac fine sandy loam in an area of Attoyac fine sandy loam, 0 to 4 percent slopes, in intermixed conifers and hardwoods; from the intersection of U.S. Highway 84 and Farm Road 2787 east of Joaquin, 2.2 miles south on Farm Road 2787, east and north on County Road 3344 to Johnson Cemetery, 150 feet north and east on logging road by cemetery, and site is 50 feet north of road in woods. Logansport West, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 56 minutes, 46.50 seconds N.; Longitude: 94 degrees, 0 minutes, 37.50 seconds W.

A—0 to 5 inches; brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable, soft; many fine and common coarse roots; strongly acid; clear smooth boundary.

E—5 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable, soft; many fine and common coarse roots; very strongly acid; clear wavy boundary.

Bt1—10 to 28 inches; red (2.5YR 4/6) fine sandy loam; weak fine subangular blocky structure; friable, slightly hard; many fine and medium roots; 10 percent discontinuous faint clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—28 to 48 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; firm, hard; common fine and medium roots; 10 percent discontinuous faint clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt3—48 to 62 inches; red (2.5YR 4/6) sandy clay loam; 1 percent medium prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm, hard; 10 percent discontinuous faint clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt4—62 to 80 inches; red (2.5YR 4/8) sandy clay loam; 10 percent medium prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm, hard; 10 percent discontinuous faint clay films on faces of peds; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 3 to 20 inches
Solum thickness: More than 80 inches
Clay content: 18 to 25 percent
Rock fragments: 0 to 5 percent
CEC/clay ratio: 0.24 to 0.40

A horizon

Hue: 2.5YR to 10YR
Value: 4 or 5
Chroma: 2 to 8
Texture: Fine sandy loam
Clay content: 8 to 20 percent
Rock fragments: Amount—0 to 5 percent; size—pebbles; kind—rounded quartzite and ironstone
Reaction: Strongly acid to slightly acid (5.1 to 6.5), unless limed

E horizon

Hue: 5YR to 10YR
Value: 5 to 7
Chroma: 3 or 4
Texture: Fine sandy loam
Clay content: 8 to 20 percent
Rock fragments: Amount—0 to 5 percent, size—pebbles; kind—rounded quartzite and ironstone
Reaction: Strongly acid to slightly acid (5.1 to 6.5), unless limed

Bw horizon (where present)

Hue: 5YR to 10YR
Value: 5 or 6
Chroma: 4
Texture: Fine sandy loam or loam
Clay content: 8 to 20 percent
Rock fragments: Amount—0 to 5 percent; kind—rounded quartzite and ironstone; size—pebbles
Reaction: Very strongly acid to slightly acid (4.5 to 6.5), unless limed

Upper Bt horizon

Hue: 10R to 5YR
Value: 3 to 5
Chroma: 6 or 8
Texture: Fine sandy loam, loam, or sandy clay loam
Clay content: 18 to 25 percent
Clay films: Location on faces of peds, contrast faint to prominent
Iron-manganese concentrations: Amount—0 to 2 percent; size—fine and medium; kind—relict
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Lower Bt horizon

Hue: 2.5YR to 7.5YR
Value: 3 to 5
Chroma: 6 or 8
Texture: Fine sandy loam, loam, or sandy clay loam
Clay content: 18 to 32 percent
Clay films: Location on ped faces, contrast faint to prominent
Iron-manganese concentrations: Amount—0 to 2 percent; size—fine and medium; kind—relict
Albic materials: 0 to 5 percent
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Austonio Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Position on landform: Linear or linear areas
Parent material: Loamy alluvium
Geology: Fluviatile terrace
Drainage class: Well drained

Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 5 to 12 percent

Associated Soils

Attoyac, Bernaldo, and Gallime soils are very deep.
Cuthbert, Eastwood, and Kirvin soils have clayey subsoils.
Dreka, Laneville, and Owentown soils are on flood plains.
Latex, Metcalf, and Sawtown soils have clayey 2Bt horizons.

Taxonomic Classification

Fine-loamy, siliceous, active, thermic Typic Hapludalfs

Typical Pedon

Austonio fine sandy loam in an area of Austonio fine sandy loam, 5 to 12 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 87 and Farm Road 2694 in Shelbyville, approximately 6.2 miles east on Farm Road 2694 to intersection with Farm Road 3471, approximately 0.3 mile south on Farm Road 3471, approximately 1.3 miles south on County Road 2603, and site is on the west side of drain in road cut. Patroon North, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 45 minutes, 1.50 seconds N.; Longitude: 93 degrees, 59 minutes, 2.30 seconds W.

A—0 to 8 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure; friable, soft; many fine to coarse roots; extremely acid; clear smooth boundary.

E—8 to 16 inches; pale brown (10YR 6/3) fine sandy loam; weak medium subangular blocky structure; friable, soft; many fine to coarse roots; moderately acid; clear smooth boundary.

Bt1—16 to 27 inches; yellowish brown (10YR 5/6) sandy clay loam; 10 percent fine and medium prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable, slightly hard; many fine and medium roots; 10 percent clay films on faces of peds; 1 percent rounded 0.1- to 3.0-inch ironstone nodules; extremely acid; gradual smooth boundary.

Bt2—27 to 41 inches; yellowish brown (10YR 5/6) sandy clay loam; 10 percent fine and coarse prominent yellowish red (5YR 4/6) and 10 percent fine and coarse prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm, slightly hard; many fine and medium roots; 10 percent clay films on faces of peds; 1 percent rounded 0.1- to 3.0-inch ironstone nodules; extremely acid; gradual smooth boundary.

Bt3—41 to 53 inches; yellowish brown (10YR 5/6) sandy clay loam; 10 percent medium distinct brownish yellow (10YR 6/8), 10 percent medium prominent red (2.5YR 4/6), 10 percent fine and medium prominent light brownish gray (10YR 6/2), and 10 percent fine and medium prominent light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm, slightly hard; common fine and medium roots; 1 percent clay films on faces of peds; extremely acid; gradual smooth boundary.

BC—53 to 70 inches; brownish yellow (10YR 6/8) sandy clay loam; 30 percent medium and coarse prominent light brownish gray (10YR 6/2), and 10 percent fine and medium prominent red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable, slightly hard; common medium roots; extremely acid; gradual smooth boundary.

2C—70 to 80 inches; light brownish gray (10YR 6/2) and brownish yellow (10YR 6/8) fine sandy loam; 1 percent fine and medium prominent red (2.5YR 4/8) mottles; massive; firm, hard; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 4 to 29 inches
Solum thickness: 50 to about 80 inches
Clay content: 18 to 30 percent, the clay content decreases by 20 percent or more from the maximum within a depth of 40 to 60 inches.
Rock fragments: Rounded quartzite or ironstone pebbles range from none to few
CEC/clay ratio: 0.40 to 0.60
Base saturation: 60 to 90 percent in the lower part of the argillic horizon

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, where value is 3, thickness is less than 7 inches
Chroma: 2 to 4
Texture: Fine sandy loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5), unless limed

E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 2 to 4, some pedons have an EB horizon with chroma of 6 or 8
Texture: Fine sandy loam
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Upper Bt horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 6 or 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—distinct to prominent; boundary—clear; shades—red, brown, or yellow
Texture: Loam or sandy clay loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Lower Bt horizon

Hue: 5YR to 10YR
Value: 4 to 6
Chroma: 6 or 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—distinct to prominent; boundary—clear; shades—red, brown, or yellow, or the horizon is variegated with these colors
Lithochromic mottles: Amount—none to many; size—fine to medium; contrast—distinct to prominent; boundary—clear; shades—gray
Texture: Loam or sandy clay loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

BC or BCt horizon

Color features: Shades of red, yellow, or brown
Texture: Loam or sandy clay loam

Albic materials: Few streaks or spots of albic materials or uncoated sand
Reaction: Very strongly acid to strongly acid (4.5 to 5.5)

2C horizon

Color features: Shades of brown, yellow, or gray
Texture: Loamy fine sand or fine sandy loam
Albic materials: Few streaks or spots of albic materials or uncoated sand
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bernaldo Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium
Geology: Fluviatile terrace
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 0 to 3 percent

Associated Soils

Besner, Gallime, and Sawtown soils have thicker surfaces.
Guyton and Mollville soils are wetter and gray throughout.
Laneville and Dreka soils are on flood plains.
Metcalf soils are somewhat poorly drained.
Sacul and Eastwood soils have clayey subsoils.

Taxonomic Classification

Fine-loamy, siliceous, semiactive, thermic Glossic Paleudalfs

Typical Pedon

Bernaldo fine sandy loam in an area of Bernaldo fine sandy loam, 0 to 3 percent slopes, in intermixed conifers and hardwoods; from the intersection of U.S. Highway 96 South and Loop 500 on the south side of Center; approximately 1.3 miles east on Loop 500 to intersection with Martin L. King Street, approximately 1.85 miles south on Martin L. King Street and County Road 2230 to roadcut on side of County Road, on north side of Huana Creek. Center, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 45 minutes, 2.00 seconds N.; Longitude: 94 degrees, 9 minutes, 19.00 seconds W.

A—0 to 5 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure; friable, soft; common fine and medium roots; moderately acid; clear smooth boundary.

E—5 to 15 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine subangular blocky structure; friable, soft; common fine and medium roots; moderately acid; gradual smooth boundary.

Bt1—15 to 27 inches; yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; friable, slightly hard; common medium roots; 10 percent clay films on faces of peds; 1 percent fine prominent red (2.5YR 4/6) masses of oxidized iron; strongly acid; clear smooth boundary.

Bt2—27 to 41 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable, slightly hard; few medium roots; 10 percent clay films on faces of peds; 10 percent medium and coarse prominent reddish brown (2.5YR 4/4), 10 percent medium prominent strong brown (7.5YR 5/6), and 1 percent medium distinct yellowish brown (10YR 5/8) masses of oxidized iron; 3 percent light yellowish brown (10YR 6/4) clay depletions; strongly acid; gradual wavy boundary.

Bt/E—41 to 54 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly hard; 7 percent clay films on faces of peds; 10 percent medium prominent yellowish red (5YR 5/6), 1 percent fine faint yellowish brown (10YR 5/8) masses of oxidized iron; 8 percent light brownish gray (10YR 6/2) clay depletions; strongly acid; gradual wavy boundary.

BtC/E—54 to 80 inches; yellowish brown (10YR 5/6) and light yellowish brown (10YR 6/4) sandy clay loam; weak medium subangular blocky structure; firm, hard; 5 percent clay films on faces of peds; 4 percent skeletans; 13 percent light brownish gray (10YR 6/2) clay depletions; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Combined thickness of A and E horizons: 6 to 20 inches
Depth to argillic horizon: 4 to 29 inches
Solum thickness: More than 80 inches
Clay content: 18 to 25 percent
Silt plus very fine sandy content: 25 to 40 percent
Rock fragments: Amount—none to few; size—pebbles; kind—rounded quartzite or ironstone
CEC/clay ratio: 0.40 to 0.60
Base saturation: 60 to 90 percent in the lower part of the argillic horizon

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 6; horizons with value of 3 and chroma of 2 or 3 are less than 7 inches thick
Chroma: 2 to 4
Texture: Fine sandy loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

E horizon

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 2 to 4
Texture: Fine sandy loam or very fine sandy loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

Bt horizon

Hue: 5YR to 10YR
Value: 4 to 7
Chroma: 3 to 8
Redoximorphic concentrations: Amount—none to many; size—medium; contrast—distinct to prominent; boundary—clear; shades—red and brown

Redoximorphic depletions: Amount—none to many; size—medium; contrast—distinct to prominent; boundary—clear; shades—gray, depletions with chroma 2 or less are below a depth of 30 inches
Texture: Loam, sandy clay loam, or clay loam
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bt/E horizon

Hue: Bt part—5YR to 10YR
Value: Bt part—4 to 7
Chroma: Bt part—3 to 8
Albic material (E): Amount—5 to 15 percent; kind—vertical streaks, pockets, or coatings; location—on the surface of peds
Redoximorphic concentrations: Bt part—amount—few to many; size—medium; contrast—distinct to prominent; boundary—clear; shades—red and brown.
Redoximorphic depletions: Bt part—amount—few to many; size—medium; contrast—distinct to prominent; boundary—clear; shades—gray
Texture: Bt part—fine sandy loam, loam, or sandy clay loam
Brittleness: Bt part—5 to 15 percent of peds
Plinthite: E part—none to 4 percent nodular plinthite
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

BCt/E horizon

Hue: BCt part—5YR to 10YR
Value: BCt part—4 to 7
Chroma: BCt part—3 to 8
Albic material (E): Amount—5 to more than 15 percent; kind—vertical streaks, pockets, or coatings; location—on the surface of peds
Redoximorphic concentrations: BCt part—amount—few to many; size—medium; contrast—distinct to prominent; boundary—clear; shades—red and brown
Redoximorphic depletions: BCt part—amount—few to many; size—medium; contrast—distinct to prominent; boundary—clear; shades—gray
Texture: BCt part—fine sandy loam, loam, or sandy clay loam
Brittleness: BCt part—5 to 15 percent of peds
Plinthite: None to 4 percent nodular plinthite
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

B't or BCt horizon (where present)

Color features: Shades of brown, red, yellow, and gray
Texture: Fine sandy loam, loam, or sandy clay loam
Albic material: 0 to 4 percent by volume
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Besner Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium
Geology: Pleistocene sediments
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep

Shrink-swell potential: Low
Slope: 0 to 3 percent

Associated Soils

Gallime soils have fine-loamy control sections.
Iulus have gray mottles in the upper part.
Mollville soils are gray throughout.

Taxonomic Classification

Coarse-loamy, siliceous, semiactive, thermic Typic Glossudalfs

Typical Pedon

Besner fine sandy loam in an area of Besner fine sandy loam, 0 to 3 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 21 and Farm Road 3409 west of San Augustine, approximately 2.3 miles south on Farm Road 3409 and County Road 272, 0.4 mile west on International Paper Road Number 681, and 50 feet north of road in timber. Norwood, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 28 minutes, 26.20 seconds N.; Longitude: 94 degrees, 14 minutes, 33.10 seconds W.

Ap—0 to 6 inches; dark brown (10YR 3/3) fine sandy loam; weak medium granular structure parting to weak fine granular; friable, soft; very strongly acid; clear smooth boundary.

E1—6 to 15 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure parting to weak fine and medium granular; friable, soft; moderately acid; gradual wavy boundary.

E2—15 to 25 inches; pale brown (10YR 6/3) fine sandy loam; weak fine subangular blocky structure parting to weak fine and medium granular; friable, soft; moderately acid; gradual wavy boundary.

E/Bt1—25 to 40 inches; 75 percent pale brown (10YR 6/3) and 25 percent brownish yellow (10YR 6/8) fine sandy loam; weak fine subangular blocky structure parting to weak fine and medium granular; friable, soft; 4 percent clay bridges between sand grains; moderately acid; gradual wavy boundary.

E/Bt2—40 to 55 inches; 70 percent very pale brown (10YR 7/3) and 30 percent brownish yellow (10YR 6/8) fine sandy loam; weak fine subangular blocky structure parting to weak fine and medium granular; friable, soft; 7 percent clay bridges between sand grains; strongly acid; gradual wavy boundary.

Bt/E1—55 to 62 inches; 85 percent yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; friable, slightly hard; 7 percent clay films; 10 percent light gray (10YR 7/2) skeletans; 3 percent medium prominent yellowish red (5YR 4/6), and 2 percent coarse prominent yellowish red (5YR 4/6) masses of oxidized iron; 2 percent plinthite nodules; strongly acid; gradual wavy boundary.

Bt/E2—62 to 80 inches; grayish brown (10YR 5/2), red (2.5YR 4/8), and reddish yellow (7.5YR 6/8) sandy clay loam; moderate medium subangular blocky structure; friable, slightly hard; 10 percent clay films; 5 percent light brownish gray (10YR 6/2) skeletans; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is moist in some or all parts for more than 30 cumulative days in normal years.
Mean annual soil temperature: 66 to 70 degrees F
Depth to albic materials (E): 14 to 37 inches
Depth to albic horizon (E): 2 to 7 inches
Depth to argillic horizon: 14 to 37 inches

Depth to glossic horizon: 14 to 37 inches
Depth to endosaturation: 40 to 60 inches
Solum thickness: More than 80 inches
Clay content: 8 to 17 percent

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Fine sandy loam
Clay content: 4 to 15 percent
Reaction: Very strongly acid to slightly acid (4.5 to 6.5), unless limed

E horizon

Hue: 10YR
Value: 5 to 7
Chroma: 2 to 4
Texture: Fine sandy loam, very fine sandy loam, or loam
Clay content: 4 to 17 percent
Redoximorphic concentrations: Amount—none to common; shades—brown, yellow, or gray
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

E/Bt horizon

Hue: E part—10YR; Bt part—7.5YR to 2.5Y
Value: E part—5 to 7; Bt part—4 to 6
Chroma: E part—2 to 4; Bt part—4 to 8
Other features: The Bt part makes up 25 to 45 percent of the E/Bt horizon
Texture: Fine sandy loam or loam
Clay content: 4 to 18 percent
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bt and upper Bt/E horizons

Hue: 7.5YR to 2.5Y
Value: 4 to 6
Chroma: 4 to 8
Texture: Loam
Clay content: 8 to 18 percent
Clay films: Location—on ped faces; contrast—faint
Brittleness: 0 to 20 percent in (Bt) parts
Albic materials (E): Comprises 5 to 35 percent of Bt/E horizon and 15 percent or more in one or more subhorizons of the Bt/E horizon
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Lower Bt/E or E/Bt horizon

Hue: 7.5YR to 2.5Y
Value: 4 to 6
Chroma: 2 to 8, or the horizon may have a variegated matrix in shades of red, brown, and yellow
Texture: Loam; some pedons have sandy clay loam below a depth of 50 inches
Clay content: 10 to 25 percent
Clay films: Location—on ped faces; contrast—faint to distinct
Redoximorphic concentrations: Amount—few to common; shades—red, brown, or yellow

Brittleness: 0 to 20 percent in (Bt) parts
Albic materials (E): Comprises 5 to 35 percent of Bt/E horizon and 15 percent or more in one or more subhorizons of the Bt/E horizon
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Betis Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Sandy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Somewhat excessively drained
Saturated hydraulic conductivity class: Rapid
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 8 percent

Associated Soils

Darco soils have a continuous subsoil below 40 inches.
Dreka, Laneville, and Iulus soils are on flood plains.
Kirvin, Cuthbert, and Maben soils have red clayey subsoils.
Lilbert and Tenaha soils have sandy surface layers 20 to 40 inches thick.
Rentzel soils are moderately well drained.

Taxonomic Classification

Sandy, siliceous, thermic Lamellic Paleudults

Typical Pedon

Betis loamy fine sand in an area of Betis loamy fine sand, 0 to 8 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 7 west and Loop 500 in Center, approximately 8.5 miles southwest on Texas Highway 7 to County Road 1184 beside Mt. Herman Cemetery, approximately 3.2 miles south on County Road 1184, approximately 0.55 mile west on timber company road, approximately 0.3 mile south on logging road, and 50 feet west of road in timber. Mount Herman, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 38 minutes, 28.34 seconds N.; Longitude: 94 degrees, 18 minutes, 26.74 seconds W.

A—0 to 7 inches; brown (10YR 5/3) loamy fine sand; single grain; loose; strongly acid; gradual smooth boundary.

Bw—7 to 28 inches; light brown (7.5YR 6/4) loamy fine sand; weak coarse subangular blocky structure; friable, soft; 10 percent faint very pale brown (10YR 7/3) skeletans; very strongly acid; gradual smooth boundary.

E and Bt1—28 to 43 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak coarse subangular blocky structure; friable, soft; 1 percent faint very pale brown (10YR 7/4) skeletans; 3 percent by volume of thin strong brown (7.5YR 4/6) (Bt) lamellae and spots; very strongly acid; gradual smooth boundary.

E and Bt2—43 to 55 inches; yellowish brown (10YR 5/4) loamy fine sand; weak coarse subangular blocky structure; friable, soft; 15 percent by volume of strong brown (7.5YR 4/6) (Bt) fine sandy loam lamellae (0.5-inch thick) and spots; very strongly acid; gradual smooth boundary.

E and Bt3—55 to 80 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak coarse subangular blocky structure; friable, soft; 25 percent by volume of strong brown (7.5YR 5/6) (Bt) fine sandy loam lamellae (3/4 to 2 inches thick); very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil is dry in some parts of the moisture control section for 75 to 90 cumulative days in most years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 24 to 80 inches
Solum thickness: More than 80 inches
Clay content: 2 to 15 percent
Base saturation: 25 to 35 percent

A horizon

Hue: 7.5YR or 10YR
Value: 4 or 5
Chroma: 2 to 4
Texture: Loamy fine sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

E horizon (where present)

Hue: 10YR
Value: 5 to 7
Chroma: 3
Texture: Fine sand or loamy fine sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

Bw horizon

Hue: 7.5YR to 10YR
Value: 5 or 6
Chroma: 4 to 8
Albic material: Amount—few to common; location—randomly distributed pockets of clean sand grains
Texture: Fine sand or loamy fine sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E and Bt horizon

Hue: E part—10YR; Bt part—7.5YR or 10YR
Value: E part—5 to 7; Bt part—4 or 5
Chroma: E part—3 or 4; Bt part—6 or 8
Lamella: Composite thickness is more than 6 inches within a depth of 80 inches
Texture: Loamy fine sand or fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bowie Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation and Reklaw Formation

Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 1 to 5 percent

Associated Soils

Iulus and Laneville soils are on flood plains.
Kirvin, Maben, and Cuthbert soils have red clayey subsoils.
Lilbert, Darco, and Tenaha soils have sandy surfaces 20 to 40 inches thick.
Rentzel soils have thick sandy surfaces.

Taxonomic Classification

Fine-loamy, siliceous, semiactive, thermic Plinthic Paleudults

Typical Pedon

Bowie fine sandy loam (fig. 5) in an area of Bowie fine sandy loam, 1 to 5 percent slopes, in conifers; from the intersection of Texas Highway 7 and Loop 500 on southwest side of Center, approximately 9.5 miles south on Texas Highway 7 to intersection with County Road 1184 at Mount Hermon Cemetery, approximately 0.35 mile on County Road 1184 to fork, 0.3 mile south on County Road 1187, site is road cut on west side of road. Mount Herman, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 41 minutes, 16.40 seconds N.; Longitude: 94 degrees, 18 minutes, 26.10 seconds W.

A—0 to 9 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure; very friable, soft; 5 percent indurated 0.2- to 0.6-inch ironstone nodules; slightly acid; clear smooth boundary.

E—9 to 17 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine subangular blocky structure; very friable, soft; 5 percent indurated 0.2- to 0.6-inch ironstone nodules; moderately acid; clear wavy boundary.

Bt—17 to 25 inches; brownish yellow (10YR 6/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly hard; 6 percent clay films on faces of peds; strongly acid; clear wavy boundary.

Btv—25 to 41 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, hard; 9 percent clay films on faces of peds; 15 percent medium prominent spherical red (2.5YR 4/8) masses of oxidized iron infused into matrix along faces of peds with sharp boundaries; 7 percent medium prominent spherical weakly cemented red (2.5YR 4/6) plinthite nodules infused into matrix along faces of peds with sharp boundaries; strongly acid; clear wavy boundary.

Btv/E—41 to 80 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, hard; 10 percent clay films on faces of peds; 30 percent medium prominent spherical red (2.5YR 4/8) masses of oxidized iron infused into matrix along faces of peds with clear boundaries; 10 percent medium prominent spherical moderately cemented red (2.5YR 4/6) plinthite nodules infused into matrix along faces of peds with sharp boundaries; 7 percent light brownish gray (10YR 6/2) (E) clay depletions; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Combined thickness of the A and E horizons: 6 to 20 inches

Figure 5.—Profile of Bowie fine sandy loam, 1 to 5 percent slopes. Bowie soils have a fine sandy loam surface over a sandy clay loam subsoil.

Depth to argillic horizon: 2 to 20 inches
Solum thickness: 60 to more than 80 inches
Clay content in the control section: 18 to 30 percent
Silt plus very fine sand: 30 to 60 percent
Very fine sand and fragments up to 3 inches in diameter: 15 to 45 percent of sand fraction
Rock fragments: Amount—none to few; size—greater than 3 inches
Redoximorphic concentrations: Iron concentrations in shades of red or yellow, are in the lower parts of the subsoil.
Redoximorphic depletions: Iron depletions in shades of gray, are in the lower part of the subsoil.
Other distinctive soil features: Brittle masses or fragments comprise 5 to 40 percent by volume in horizons containing plinthite.
Concentrated minerals: Depth to horizons that contain 5 percent or more plinthite by volume is 25 to 60 inches. Strongly cemented or indurated iron oxide concretions and ironstone pebbles less than 3 inches in diameter range from 0 to 5 percent by volume throughout.
CEC/clay ratio: 6.0 to 18.0 meg/100 gram of soil
Base saturation: 10 to 34 percent at 50 inches below the top of the argillic horizon

A horizon

Hue: 10YR
Value: 3 to 5, horizons with value of 3 are less than 7 inches thick
Chroma: 2 to 4

Texture: Fine sandy loam
Reaction: Very strongly acid to slightly acid (4.5 to 6.5), unless limed

E horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 3 or 4
Texture: Fine sandy loam
Reaction: Very strongly acid to slightly acid (4.5 to 6.5), unless limed

Bt horizon

Hue: 7.5YR or 10YR
Value: 4 or 6
Chroma: 4 to 8
Redoximorphic concentrations: Amount—none to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; shades—red, brown or yellow; location—in the matrix
Texture: Fine sandy loam, sandy clay loam, or clay loam
Albic material: Amount—0 to 4 percent; kind—streaks, coatings, or pockets of uncoated sand
Plinthite: Amount—0 to 4 percent by volume; kind—nodular plinthite
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Btv horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 4 to 8
Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; shades—red or brown
Redoximorphic depletions: Amount—none to common; size—fine to coarse; contrast—faint or distinct boundary—diffuse to clear; shades—gray located below a depth of 30 inches
Texture: Fine sandy loam, sandy clay loam, or clay loam
Albic material: Amount—0 to 4 percent; kind—coatings, streaks, or pockets of albic material
Plinthite: Amount—5 to 15 percent by volume; kind—nodular plinthite
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Btv/E or Bt/E horizon

Hue: Btv or Bt part—7.5YR or 10YR; E part—10YR
Value: Btv or Bt part—5 or 6; E part—5 to 7
Chroma: Btv or Bt part—4 to 8; E part—1 or 2
Color features: Maybe variegated in all these colors
Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; shades—red or brown
Redoximorphic depletions: Amount—few to many; size—fine to coarse; contrast—faint or distinct; boundary—diffuse to clear; shades—gray
Texture: Fine sandy loam, sandy clay loam, or clay loam
Albic materials (E): Amount—5 to 20 percent by volume; kind—coatings, streaks, or pockets
Plinthite: Amount—5 to 15 percent by volume; kind—primarily in nodular form in the upper part, and 0 to 15 percent in the lower part
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Bub Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Clayey residuum weathered from glauconitic sandstone
Geology: Weches Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Shallow to paralithic bedrock
Shrink-swell potential: Moderate
Slope: 2 to 5 percent

Associated Soils

Trawick soils have sola 40 to 60 inches thick.

Taxonomic Classification

Clayey, mixed, active, thermic, shallow Typic Hapludalfs

Typical Pedon

Bub clay loam in an area of Bub clay loam, 2 to 5 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 21 and Spur 35 near McMahon's Chapel, approximately 1.7 miles east on Texas Highway 21, 0.7 mile southeast on Kings Road, approximately 1.5 miles south on Sid Dennis Lane, and 30 feet west of road in timber. Geneva, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 27 minutes, 8.50 seconds N.; Longitude: 93 degrees, 56 minutes, 27.00 seconds W.

Ap—0 to 4 inches; dark reddish brown (5YR 3/3) clay loam; weak fine subangular blocky structure parting to weak fine granular; friable, soft; 2 percent sandstone fragments; moderately acid; clear smooth boundary.

Bt—4 to 12 inches; reddish brown (2.5YR 4/4) clay; 10 percent medium prominent olive brown (2.5Y 4/4) mottles; moderate medium subangular blocky structure; firm, hard; 15 percent clay films; strongly acid; gradual smooth boundary.

BtC—12 to 18 inches; yellowish red (5YR 5/8) sandy clay; 5 percent fine, medium, and coarse prominent dark olive brown (2.5Y 3/3), and 5 percent medium and coarse distinct yellowish red (5YR 4/6) mottles; weak medium subangular blocky parting to massive; firm, hard; 10 percent clay films; strongly acid; clear smooth boundary.

Cr—18 to 80 inches; 60 percent dark greenish gray (5G 3/1), 25 percent strong brown (7.5YR 4/6), 10 percent light gray (10YR 7/1), and 5 percent yellowish brown (10YR 5/6) sandy clay; platy structure parting to massive; firm, hard; stratified greensand marl and ironstone; slightly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for as long as 90 cumulative days in normal years.
Mean annual soil temperature: 67 to 69 degrees F
Depth to paralithic contact: 12 to 20 inches
Depth to argillic horizon: 2 to 6 inches
Solum thickness: 12 to 20 inches

Clay content: 35 to 45 percent
Rock fragments: 0 to 34 percent
CEC/clay ratio: 0.40 to 0.60

A or Ap horizon

Hue: 10R to 2.5Y
Value: 2 or 3
Chroma: 2 to 4
Texture: Clay loam
Clay content: 27 to 39 percent
Rock fragments: Amount—0 to 50 percent
Reaction: Moderately acid or slightly acid (5.6 to 6.5)

Bt horizon

Hue: 10R to 5YR
Value: 3 or 4
Chroma: 4 to 8
Texture: Clay loam, sandy clay, or clay
Clay content: 30 to 55 percent
Clay films: Location—on surfaces of peds, thin, discontinuous
Rock fragments: Amount—0 to 34 percent, but is commonly 2 to 10 percent
Base saturation: 62 percent
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

BtC horizon

Hue: 10R to 5YR
Value: 3 to 5
Chroma: 4 to 8
Texture: Clay loam, sandy clay, or clay
Clay content: 35 to 55 percent
Clay films: Location—on surfaces of peds, thin, discontinuous
Rock fragments: Amount—0 to 34 percent, but is commonly 2 to 10 percent
Base saturation: 62 percent
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Cr horizon

Ironstone colors: Shades of red and brown
Weathered glauconitic materials colors: Shades of green, yellow, and brown
Shale and marl colors: Shades of gray, brown, and green
Other features: Psuedomorphic marine shells are commonly in the upper part with fossilized marine shells in the lower part.
Effervescence: The shells and marl layers are very slightly effervescent to strongly effervescent
Reaction: Moderately acid to slightly alkaline (5.6 to 7.8)

Chireno Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread

Parent material: Clayey alluvium
Geology: Weches Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Very deep
Shrink-swell potential: High
Slope: 0 to 2 percent

Associated Soils

Alto soils have yellow subsoils.
Nacogdoches soils are red throughout.
Trawick soils have sola 20 to 40 inches thick.

Taxonomic Classification

Fine, mixed, superactive, thermic Pachic Argiudolls

Typical Pedon

Chireno clay loam (fig. 6) in an area of Chireno clay loam, 0 to 2 percent slopes, in other grass/herbaceous cover; from the intersection of Texas Highway 21 and Farm Road 1 east of San Augustine, approximately 0.55 mile west on Texas Highway 21, approximately 0.6 mile northeast on field roads to site in newly cleared pasture. Chinquapin, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 29 minutes, 0.52 seconds N.; Longitude: 94 degrees, 0 minutes, 0.46 seconds W.

Ap1—0 to 3 inches; dark brown (10YR 3/3) clay loam; moderate medium subangular blocky structure; firm, hard; many fine, many medium, and few coarse roots; 1 percent nonflat rounded 0.1- to 1.4-inch ironstone nodules; slightly acid; clear irregular boundary.

Ap2—3 to 7 inches; very dark grayish brown (10YR 3/2) clay loam; moderate medium subangular blocky structure; firm, hard; many fine, many medium, and few coarse roots; few fine and few medium pores; 1 percent nonflat rounded 0.1- to 1.4-inch ironstone nodules; slightly acid; clear irregular boundary.

Bt1—7 to 16 inches; 85 percent very dark gray (10YR 3/1) clay; moderate medium subangular blocky structure; firm, hard; many fine and few medium roots; 50 percent clay films on faces of peds; 15 percent fine prominent strong brown (7.5YR 4/6) masses of oxidized iron; 1 percent nonflat rounded 0.1- to 1.4-inch ironstone nodules; moderately acid; clear wavy boundary.

Bt2—16 to 33 inches; 60 percent very dark gray (10YR 3/1) and 39 percent dark yellowish brown (10YR 4/6) clay; moderate medium subangular blocky structure; firm, hard; few fine roots; 20 percent clay films on faces of peds; 1 percent fine prominent yellowish red (5YR 5/8) masses of oxidized iron; 1 percent nonflat rounded 0.1- to 1.4-inch ironstone nodules; moderately acid; gradual wavy boundary.

Bt3—33 to 50 inches; 70 percent strong brown (7.5YR 5/6) and 29 percent very dark gray (10YR 3/1) clay; moderate medium subangular blocky structure; firm, hard; 10 percent clay films on faces of peds; 1 percent fine prominent yellowish red (5YR 5/8) masses of oxidized iron; 1 percent nonflat rounded 0.1- to 1.4-inch ironstone nodules; moderately acid; gradual wavy boundary.

Bt4—50 to 80 inches; 70 percent reddish yellow (7.5YR 6/6) and 29 percent very dark gray (10YR 3/1) clay; moderate medium subangular blocky structure; firm, hard; 10 percent clay films on faces of peds; 1 percent fine prominent yellowish red (5YR 5/8) masses of oxidized iron; 1 percent nonflat rounded 0.1- to 1.4-inch ironstone nodules; slightly acid.

Figure 6.—Profile of Chireno clay loam, 0 to 2 percent slopes. Chireno soils have a thick dark colored surface layer, known as mollic epipedons. Mollic epipedons a have high content of organic matter. (Scale in centimeters.)

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for as long as 90 cumulative days in normal years.
Mean annual soil temperature: 67 to 69 degrees F
Depth to argillic horizon: 6 to 16 inches
Solum thickness: More than 80 inches
Clay content: 35 to 42 percent
CEC/clay ratio: 0.60 or more
Mollic epipedon: 20 to 40 inches thick
Iron-manganese concretions and masses: Amount—few to common; location—in most pedons mainly below a depth of 40 inches

A horizon

Hue: 7.5YR or 10YR
Value: 2 or 3
Chroma: 1 to 3
Texture: Clay loam
Clay content: 15 to 30 percent
Reaction: Moderately acid to neutral (5.6 to 7.3)

Upper Bt horizon

Hue: 7.5YR to 5Y
Value: 3
Chroma: 1 to 3
Redoximorphic concentrations: Amount—few to common; size—fine and medium; contrast—distinct; boundary—diffuse or clear; location—mainly below a depth of 40 inches
Texture: Clay loam or clay in the upper part and middle part, sandy clay loam or clay loam in the lower part
Reaction: Slightly acid to slightly alkaline (6.1 to 7.8)

Middle Bt horizon

Hue: 7.5YR to 5Y
Value: 3 to 6
Chroma: 1 to 8
Texture: Clay loam or clay
Redoximorphic features: The masses of iron-manganese in the lower part appear to indicate significant durations of saturation. The glauconitic parent materials resist reduction. This may be the reason there are no redoximorphic depletions.
Reaction: Slightly acid to slightly alkaline (6.1 to 7.8)

Lower Bt horizon

Hue: 7.5YR to 5Y
Value: 4 to 6
Chroma: 4 to 8
Texture: Sandy clay loam, clay loam, or clay
Redoximorphic concentrations: Amount—few to common; size—fine and medium; contrast—distinct; boundary—diffuse or clear; location—mainly below a depth of 40 inches
Other features: The glauconitic parent materials resist reduction. This may be the reason there are no redoximorphic depletions.
Reaction: Slightly acid to slightly alkaline (6.1 to 7.8)

Corrigan Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Clayey residuum weathered from mudstone
Geology: Catahoula Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Moderately deep to paralithic bedrock
Shrink-swell potential: High
Slope: 1 to 5 percent

Associated Soils

Letney soils have sandy surfaces 20 to 40 inches thick.
Tehran soils have sandy surfaces more than 40 inches thick.

Taxonomic Classification

Fine, smectitic, thermic Albaquic Hapludalfs

Typical Pedon

Corrigan fine sandy loam in an area of Corrigan fine sandy loam, 1 to 5 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 87 and Farm Road 2426 in Yellowpine, approximately 11.1 miles south on Texas Highway 87 to intersection with Clarkstown Road, 1.0 mile southwest on Clarkstown Road, site is 150 feet north of road in compartment #136 Sabine National Forest. Fairmount, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 10 minutes, 21.90 seconds N.; Longitude: 93 degrees, 44 minutes, 37.90 seconds W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine subangular blocky structure; friable, soft; few fine roots; strongly acid; clear smooth boundary.

E—6 to 14 inches; light yellowish brown (10YR 6/4) fine sandy loam; 1 percent medium distinct yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; friable, soft; few fine roots; strongly acid; clear wavy boundary.

Bt1—14 to 23 inches; grayish brown (10YR 5/2) clay; 8 percent medium prominent red (2.5YR 4/6) and 8 percent fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; very firm, very hard; 15 percent clay films and 1 percent slickensides (pedogenic); very strongly acid; gradual smooth boundary.

Bt2—23 to 31 inches; grayish brown (10YR 5/2) clay; 10 percent medium distinct dark olive brown (2.5Y 3/3) mottles; moderate medium subangular blocky structure; very firm, very hard; 5 percent clay films; 20 percent mudstone fragments; extremely acid; clear wavy boundary.

BtC—31 to 39 inches; light brownish gray (10YR 6/2) clay; 10 percent medium distinct dark olive brown (2.5Y 3/3) mottles; moderate medium subangular blocky parting to platy structure; very firm, very hard; 3 percent clay films; 10 percent medium distinct brownish yellow (10YR 6/6) masses of oxidized iron; extremely acid; clear wavy boundary.

Cr—39 to 80 inches; light brownish gray (2.5Y 6/2) stratified silty clay loam; massive parting to platy; extremely firm, extremely hard; Cr is siltstone; extremely acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.

Mean annual soil temperature: 67 to 70 degrees F

Combined thickness of A and E horizon: 3 to 14 inches

Depth to argillic horizon: 2 to 14 inches

Solum thickness: 20 to 40 inches

Paralithic contact: 20 to 40 inches

Clay content: 18 to 30 percent, the clay content decreases by 20 percent or more from the maximum within a depth of 40 to 60 inches

Rock fragments: Amount—none to few; size—pebbles; kind—rounded quartzite or ironstone

Base saturation: 60 or more directly above paralithic contact

A horizon

Hue: 10YR
Value: 2 to 4, where moist values are less than 3.5, the horizon is less than 6 inches thick
Chroma: 1 or 2
Texture: Fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E horizon

Hue: 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: Fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Upper Bt horizon

Hue: 10YR to 5Y
Value: 4 to 6
Chroma: 2; the low chroma is believed to be primarily caused by the lithology rather than wetness
Mottles: Amount—few to common; size—fine to medium; contrast—distinct to prominent; boundary—clear; shades—red and brown
Texture: Clay or silty clay
Clay content: Upper 20 inches of the Bt horizon average between 40 and 60 percent, but the upper few inches of the Bt horizon commonly ranges up to 70 percent clay
COLE value: Upper part of the Bt horizon is 0.09 to 0.14
Potential linear extensibility: Less than 3 inches in the upper 40 inches of the soil
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Lower Bt and BtC horizon

Hue: 10YR to 5Y
Value: 4 to 7
Chroma: 2 to 4
Mottles: Amount—few to common; size—fine to medium; contrast—distinct to prominent; boundary—clear; shades—gray and olive
Texture: Clay or silty clay
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Cr horizon

Lithology: Weakly consolidated tuffaceous siltstone or mudstone that is bentonitic and contains volcanic ash, volcanic glass, or other pyroclastic materials
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Cuthbert Series

MLRA: Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope

Parent material: Clayey residuum weathered from sandstone and shale
Geology: Sparta Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Moderately deep to densic material
Shrink-swell potential: Moderate
Slope: 5 to 35 percent

Associated Soils

Darco soils have sandy surface layers 40 to 60 inches thick.
Iulus soils have coarse-loamy control sections and are on flood plains.
Sacul soils have sola 40 to 60 inches thick.
Tenaha soils have sandy surface layers 20 to 40 inches thick.

Taxonomic Classification

Fine, mixed, semiactive, thermic Typic Hapludults

Typical Pedon

Cuthbert fine sandy loam in an area of Cuthbert fine sandy loam, 5 to 15 percent slopes, in conifers; from intersection of Texas Highway 21 and Farm Road 1196 west of San Augustine, 1.7 miles east on Texas Highway 21, 0.9 mile south and east on County Road 256, 1.4 miles south on County Road 255, approximately 1,000 feet east on timber company access road, site is 100 feet north of road in borrow pit wall. Chireno South, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 29 minutes, 4.80 seconds N.; Longitude: 94 degrees, 15 minutes, 25.90 seconds W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine subangular blocky structure; friable, slightly hard; common fine, few medium, and few coarse roots; 7 percent flat sandstone fragments; moderately acid; clear wavy boundary.

E—6 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable, slightly hard; common fine, few medium, and few coarse roots; strongly acid; clear wavy boundary.

Bt1—10 to 21 inches; yellowish red (5YR 4/6) clay; 10 percent medium prominent pale brown (10YR 6/3) and 10 percent medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, hard; common fine, few medium, and few coarse roots; 15 percent clay films; very strongly acid; gradual wavy boundary.

Bt2—21 to 31 inches; yellowish red (5YR 4/6) clay; 6 percent fine and medium distinct reddish yellow (7.5YR 6/8) mottles; moderate fine subangular blocky structure parting to moderate medium subangular blocky; firm, hard; common fine, few medium, and few coarse roots; 15 percent clay films; 5 percent clayey shale fragments; 20 percent light brownish gray (10YR 6/2) soft shale fragments; very strongly acid; clear wavy boundary.

CB—31 to 37 inches; light gray (10YR 7/2) clay; 10 percent medium prominent yellowish red (5YR 4/6), 10 percent coarse prominent yellowish red (5YR 4/6), and 10 percent medium distinct reddish yellow (7.5YR 6/8) mottles; platy structure parting to weak medium subangular blocky; firm, hard; few fine roots in cracks; extremely acid; clear smooth boundary.

Cd—37 to 80 inches; light reddish brown (5YR 6/3) stratified clay; 10 percent coarse prominent light gray (10YR 7/2), 10 percent coarse distinct reddish yellow (7.5YR 6/8), and 1 percent coarse distinct yellowish red (5YR 5/6) mottles; platy structure; firm, hard; it is shale with few ironstone strata; extremely acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 65 to 69 degrees F
Depth to densic contact: 20 to 40 inches
Depth to albic horizon: 3 to 9 inches
Depth to argillic horizon: 3 to 20 inches
Surface fragments: Ironstone and sandstone fragments on, or partially imbedded in the A horizon cover less than 1 percent to about 20 percent of the surface. These are mainly flat, angular fragments 1 to 6 inches thick and 3 to 36 inches across the long axis.
Solum thickness: 20 to 40 inches
Clay content: 35 to 60 percent
Silt content: Less than 30 percent
Rock fragments: 0 to 15 percent
CEC/clay ratio: 0.24 to 0.40

A or Ap horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 to 4, or value of 3 and chroma of 1
Texture: Fine sandy loam or their gravelly or stony counterparts
Graded phase: A graded phase that has the surface and subsurface layer removed is also recognized with a texture of gravelly clay loam.
Clay content: 2 to 15 percent
Rock fragments: Amount—0 to 50 percent; kind—ironstone and sandstone
Reaction: Very strongly acid to slightly acid (4.5 to 6.5); graded phases are moderately acid to neutral (5.6 to 7.3)

E horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: Fine sandy loam
Clay content: 2 to 15 percent
Rock fragments: Amount—0 to 50 percent; kind—ironstone and sandstone
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bt horizon

Hue: 2.5YR to 7.5YR
Value: 3 to 5
Chroma: 4 to 8
Texture: Sandy clay loam, clay loam, sandy clay, or clay
Clay content: 35 to 60 percent
Clay films: Location—on faces of peds; contrast—faint to prominent
Lithochromic mottles: Amount—0 to 20 percent; shades—yellow, gray, or brown
Rock fragments: Amount—0 to 14 percent ironstone; kind—sandstone or shale, fragments or strata
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Bt/C, BCt or CB horizon

Hue: 2.5YR to 10YR
Value: 4 to 7
Chroma: 1 to 8

Color features: Can be stratified or variegated with above colors
Texture: Fine sandy loam, sandy clay loam, clay loam, or clay
Clay content: 18 to 50 percent
Clay films: Location—faces of peds or rock fragments; contrast—faint to prominent
Rock fragments: Amount—0 to 14 percent; kind—ironstone, sandstone, or shale fragments or strata
Other features: The degree of weathering is variable and some pedons have BCt horizons with only a few visible parent material fragments.
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

C or Cd horizon

Hue: 2.5YR to 10YR
Value: 4 to 7
Chroma: 1 to 8
Texture: Stratified fine sandy loam, sandy clay loam, clay loam, or clay
Clay content: 18 to 45 percent
Clay films: Most pedons have clay flows along some vertical fractures.
Rock fragments: Amount—0 to 14 percent; kind—ironstone, sandstone, or shale
Other features: Roots penetrate the materials, but are along fractures or cleavage planes. Many pedons have discontinuous fractured, strongly cemented or indurated sandstone layers about 1 to 4 inches thick.
Reaction: Extremely acid or very strongly acid (3.6 to 5.0)

Darco Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Broad interstream divides
Position on hillslope: Convex or linear side slopes
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Somewhat excessively drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 1 to 15 percent

Associated Soils

Cuthbert soils have clayey control sections.
Iulus soils have coarse-loamy control sections and are on flood plains.
Rentzel soils have gray mottles in the upper part.
Tenaha soils have sola 40 to 60 inches thick.

Taxonomic Classification

Loamy, siliceous, semiactive, thermic Grossarenic Paleudults

Typical Pedon

Darco loamy fine sand in an area of Darco loamy fine sand, 1 to 8 percent slopes, in intermixed conifers and hardwoods; from the intersection of Farm Road 3448 and Texas Highway 21 west of Geneva, north on Farm Road 3448 to end of pavement, approximately 1.9 miles north on Boggy Creek Road to 'Y' in road, 0.75 mile north and west on U.S. Forest Service Road 108, and 25 feet south in compartment #65 Sabine National Forest. Patroon South, Texas USGS 7.5-minute topographic

quadrangle; Latitude: 31 degrees, 31 minutes, 37.50 seconds N.; Longitude: 93 degrees, 57 minutes, 34.30 seconds W.

A—0 to 9 inches; brown (10YR 5/3) loamy fine sand; single grain; loose, loose; common fine, common medium, and few coarse roots; strongly acid; clear smooth boundary.

E1—9 to 35 inches; yellowish brown (10YR 5/4) loamy fine sand; single grain; loose, loose; common fine, common medium, and few coarse roots; moderately acid; gradual smooth boundary.

E2—35 to 50 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak fine subangular blocky structure; very friable, loose; few fine roots and few medium roots; moderately acid; gradual smooth boundary.

E3—50 to 70 inches; light yellowish brown (10YR 6/4) loamy fine sand; 1 percent fine faint yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; very friable, loose; moderately acid; gradual wavy boundary.

Bt—70 to 80 inches; strong brown (7.5YR 5/6) fine sandy loam; 1 percent fine faint yellowish red (5YR 5/6) and 1 percent medium faint yellowish red (5YR 5/6) mottles; weak fine subangular blocky structure parting to weak medium subangular blocky; friable, soft; 15 percent clay films; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for as long as 90 cumulative days in normal years.
Mean annual soil temperature: 67 to 69 degrees F
Depth to argillic horizon: 40 to 72 inches
Solum thickness: More than 80 inches
Thickness of A and E horizons: 40 to 72 inches
Clay content: 12 to 35 percent
Sand fraction: Less than 10 percent coarse or very coarse sand
Rock fragments: 0 to 34 percent
CEC/clay ratio: 0.40 to 0.60
Base saturation: 15 to 35 percent in the lower part of the Bt horizon
Exchangeable calcium: 1 to 3 meq/100 grams of soil

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Loamy fine sand
Reaction: Very strongly acid to slightly acid (4.5 to 6.5), unless limed

E horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 3 or 4
Texture: Loamy fine sand or fine sand
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

BE horizon (where present)

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 6 or 8
Texture: Fine sand or loamy fine sand
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bt horizon

Hue: 2.5YR to 10YR
Value: 4 to 6
Chroma: 6 to 8
Mottles: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in the matrix; shades—red, brown, or yellow
Redoximorphic depletions: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in the matrix; shades—gray, below a depth of 50 inches in some pedons
Texture: Fine sandy loam or sandy clay loam
Other features: Plinthite segregations range from 0 to 5 percent
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Dreka Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Flood plains
Position on landform: Concave or linear areas
Parent material: Loamy alluvium
Geology: Alluvium
Drainage class: Somewhat poorly drained
Saturated hydraulic conductivity class: Slow
Soil depth class: Very deep
Shrink-swell potential: High
Slope: 0 to 1 percent

Associated Soils

Iulus and Owentown soils have coarser textures throughout.
Laneville soils are drier and brown.

Taxonomic Classification

Fine-silty, siliceous, active, nonacid, thermic Aeric Fluvaquents

Typical Pedon

Dreka loam in an area of Dreka loam, frequently flooded, in hardwoods; from the square in Center; north 7.5 miles on Farm Road 699, and site is 50 feet west of Farm Road 699 on the flood plain of Flat Fork creek, south of the channel in timber. Tenaha East, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 53 minutes, 18.80 seconds N.; Longitude: 94 degrees, 9 minutes, 21.60 seconds W.

A—0 to 9 inches; grayish brown (10YR 5/2) loam; moderate fine subangular blocky structure; firm, hard; common fine and medium roots; 10 percent patchy distinct dark yellowish brown (10YR 4/4) iron stains on surfaces along pores; 10 percent patchy distinct dark yellowish brown (10YR 4/6) iron stains on surfaces along root channels; moderately acid; clear smooth boundary.

Bg1—9 to 13 inches; light brownish gray (2.5Y 6/2) clay loam; moderate medium subangular blocky structure; firm, hard; 10 percent medium prominent yellowish brown (10YR 5/6) masses of oxidized iron; moderately acid; gradual smooth boundary.

Bg2—13 to 30 inches; light brownish gray (2.5Y 6/2) clay loam; moderate medium subangular blocky structure; firm, hard; 10 percent medium distinct light olive brown (2.5Y 5/6), and 1 percent fine prominent yellowish brown (10YR 5/8) masses of oxidized iron; moderately acid; gradual smooth boundary.

Bg3—30 to 43 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; firm, very hard; 10 percent medium distinct dark yellowish brown (10YR 4/4), and 1 percent fine distinct yellowish brown (10YR 5/8) masses of oxidized iron; 1 percent iron-manganese masses; slightly acid; gradual smooth boundary.

2Bg—43 to 80 inches; grayish brown (2.5Y 5/2) clay; moderate medium subangular blocky structure; very firm, very hard; 10 percent fine faint light olive brown (2.5Y 5/4) masses of oxidized iron; 1 percent iron-manganese masses; 2 percent fine platy gypsum crystals between peds; slightly alkaline.

Range in Characteristics

Soil moisture: An aquic soil moisture regime.
Mean annual soil temperature: 67 to 69 degrees F
Depth to cambic horizon: 4 to 12 inches
Depth to lithologic discontinuity: 40 to 60 inches
Depth to redoximorphic concentrations: 0 to 12 inches
Depth to redoximorphic depletions: 0 to 12 inches
Depth to episaturation: 6 to 20 inches
Solum thickness: More than 80 inches
Clay content: 18 to 30 percent
Rock fragments: 0 to 2 percent
CEC/clay ratio: 0.40 to 0.60

A or Ap Horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Loam
Clay content: 10 to 30 percent
Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in the matrix; shades—brown or yellow
Redoximorphic depletions: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in the matrix; shades—gray
Iron-manganese concentrations: Amount—few to many; size—fine to coarse; kind—nodules, masses, or concretions
Rock fragments: 0 to 2 percent
EC (dS/m): 0 to 2
Reaction: Moderately acid to moderately alkaline (5.6 to 8.4)

Bg Horizon

Hue: 10YR or 2.5Y
Value: 5 or 6
Chroma: 1 or 3
Depth: A layer with value of 5 and chroma of 2, or value of 6 and chroma of 3 is present within a depth of 30 inches
Texture: Loam, clay loam, or silty clay loam
Clay content: 18 to 35 percent

Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in matrix; shades—red, brown, or yellow
Redoximorphic depletions: Amount—none to many; size—fine to coarse; contrast—faint or distinct; boundary—diffuse; location—in matrix; shades—olive or gray
Iron-manganese concentrations: Amount—few to many; size—fine to coarse; kind—masses, concretions, or nodules
Rock fragments: 0 to 2 percent
Calcium carbonate concretions: 0 to 2 percent
EC (dS/m): 0 to 2
Sodium adsorption ratio: 0 to 2
Reaction: Moderately acid to moderately alkaline (5.6 to 8.4)

2Bg Horizon

Hue: 10YR or 2.5Y
Value: 4 to 6
Chroma: 1 or 2
Texture: Clay loam, silty clay, clay
Clay content: 35 to 50 percent
Redoximorphic concentrations: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in matrix; shades—red, brown, or yellow
Redoximorphic depletions: Amount—none to common; size—fine to coarse; contrast—faint to distinct; boundary—diffuse; location—in matrix; shades—gray or blue
Iron-manganese concentrations: Amount—few to many; size—fine to coarse; kind—masses, concretions, or nodules
Calcium carbonate concretions: 0 to 5 percent
EC (dS/m): 0 to 4
Sodium adsorption ratio: 0 to 4
Reaction: Moderately acid to slightly alkaline (5.6 to 7.8)

Eastwood Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Wilcox Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to densic material
Shrink-swell potential: High
Slope: 1 to 15 percent

Associated Soils

An unnamed soil that is 20 to 40 inches deep over mudstone.
Guyton and Mollville soils are wetter and gray throughout.
Lilbert soils have sandy surfaces more than 20 inches thick.
Maben soils are 20 to 40 inches deep.
Metcalf soils are somewhat poorly drained.
Meth soils are more than 60 inches deep.

Sawtown and Latex soils have loamy subsoils.

Taxonomic Classification

Fine, smectitic, thermic Chromic Vertic Hapludalfs

Typical Pedon

Eastwood very fine sandy loam in an area of Eastwood very fine sandy loam, 1 to 5 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 87 and Farm Road 417 in Shelbyville, 6.2 miles south on Texas Highway 87 to junction with Farm Road 139, 6.6 miles east on Farm Road 139 to junction with Farm Road 3184, 0.2 mile east on Farm Road 3184 to U.S. Forest Service Dreka Work Station, 0.2 mile north of Farm Road 3184 on Powerline Road, and 150 feet east of powerline in compartment #29 Sabine National Forest. Patroon North, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 42 minutes, 33.10 seconds N.; Longitude: 93 degrees, 54 minutes, 32.10 seconds W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak fine subangular blocky structure; friable, soft; many fine to coarse roots; very strongly acid; gradual wavy boundary.

E—7 to 10 inches; brown (10YR 5/3) very fine sandy loam; weak fine subangular blocky structure; friable, soft; many fine to coarse roots; many fine to coarse pores; strongly acid; clear wavy boundary.

Bt—10 to 19 inches; dark red (2.5YR 3/6) clay; 10 percent fine distinct pale brown (10YR 6/3) mottles; weak medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common fine and medium roots; 30 percent clay films on faces of peds; 20 percent pressure faces; very strongly acid; gradual wavy boundary.

Btss1—19 to 30 inches; dark red (2.5YR 3/6) clay; 10 percent medium prominent light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common fine roots; 30 percent grayish brown (10YR 5/2) clay films on faces of peds; 7 percent slickensides (pedogenic); very strongly acid; gradual wavy boundary.

Btss2—30 to 40 inches; light brownish gray (10YR 6/2) clay; 25 percent medium prominent dark red (2.5YR 3/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common fine to coarse roots; 30 percent grayish brown (10YR 5/2) clay films on faces of peds; 7 percent slickensides (pedogenic); very strongly acid; gradual wavy boundary.

Btss3—40 to 55 inches; light brownish gray (10YR 6/2) clay; 10 percent medium distinct light brown (7.5YR 6/4) and 10 percent fine prominent dark red (2.5YR 3/6) mottles; moderate medium prismatic structure parting to weak medium angular blocky structure; firm, hard; common fine to coarse roots; 15 percent grayish brown (10YR 5/2) clay films on faces of peds; 5 percent slickensides (pedogenic); very strongly acid; clear smooth boundary.

Cd1—55 to 67 inches; light gray (10YR 7/1) and strong brown (7.5YR 5/6) sandy clay loam; platy structure; firm, hard; 1 percent red (2.5YR 4/6) clay films on rock fragments; extremely acid; clear smooth boundary.

Cd2—67 to 80 inches; brownish yellow (10YR 6/6) and yellowish red (5YR 5/8) and grayish brown (10YR 5/2) clay loam; platy structure; firm, hard; 1 percent barite crystals; extremely acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.

Mean annual soil temperature: 67 to 70 degrees F

Depth to argillic horizon: 2 to 16 inches
Solum thickness: 40 to 60 inches
Clay content: 40 to 60 percent. The clay content in the upper part of the Bt horizon is more than twice the clay content in the lower part of the epipedon. Typically, the lower solum decreases about 20 to 30 percent in clay content, or a Cd horizon is encountered within 60 inches of the surface.
Rock fragments: Some pedons contain a few fragments mainly less than 6 inches across of petrified wood, fossilized shells, or ironstone pebbles.
Base saturation: 35 to 60 percent at 50 inches below the top of the argillic horizon or at the base of a BCt horizon, whichever is shallower.
Aluminum saturation: In the upper 20 inches of the argillic horizon has a weighted average of 45 to 65 percent. Base saturation is 35 to 60 percent at 50 inches below the top of the argillic horizon or at the base of a BCt horizon, whichever is shallower.
Redoximorphic depletions: Few to common gray iron depletions are within the upper 10 inches of the argillic horizon in some pedons, but these are considered relict and not related to contemporary wetness.
COLE: 0.09 to 0.14 in the upper 20 inches of the Bt horizon.
Other features: PLE ranges from 2.5 to about 4 inches in the upper 50 inches. The soil cracks when dry, typically between June and September. The cracks are 0.5-inch or more wide at a depth of 20 inches and are at least 12 inches long.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Very fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 3 to 6
Texture: Very fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

Upper Bt horizon

Hue: 2.5YR or 5YR
Value: 3 to 5
Chroma: 6 or 8
Redoximorphic concentrations: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; shades—red and brown
Redoximorphic depletions: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; shades—gray
Texture: Clay or silty clay
Clay content: 40 to 65 percent
Other features: None to common pressure faces and small slickensides in the Bt2 horizon.
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Lower Bt or Btss horizon

Color features: Shades of red, brown, or gray, some horizons have a variegated matrix with these colors

Redoximorphic concentrations (relict): Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; shades—red, brown, and yellow
Redoximorphic depletions (relict): Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; shades—gray
Texture: Clay, silty clay
Clay content: 40 to 60 percent
Other features: Few to common, pressure faces and small slickensides less than 4 inches across
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

BCt horizon (where present)

Color features: Shades of brown or gray
Texture: Loam, clay loam, or silty clay loam; texture also includes clay in pedons that have a Cd horizon within a depth of 60 inches.
Other features: Lithochromic mottles in shades of red, brown, yellow, or gray. Some pedons have a variegated matrix with these colors. Most pedons contain few to common white masses of barite.
Reaction: Extremely acid to slightly acid (3.6 to 6.5)

C or Cd horizon

Color features: Shades of red, brown, yellow, or gray
Texture: Sandy clay loam, the material is weakly consolidated and slakes in water.
Other features: Lithochromic mottles and/or strata in shades of red, brown, yellow, or gray. Some pedons have a variegated matrix with these colors. Most pedons contain a few masses of white barite salts.
Reaction: Very strongly acid to neutral (4.5 to 7.3)

Etoile Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Cook Mountain Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to densic material
Shrink-swell potential: High
Slope: 1 to 15 percent

Associated Soils

Eastwood soils are more acid in the upper part.
LaCerda and Naclina soils are vertisols.

Taxonomic Classification

Fine, smectitic, thermic Vertic Hapludalfs

Typical Pedon

Etoile loam in an area of Etoile loam, 1 to 5 percent slopes (fig. 7); south of San Augustine, from the intersection of Farm Road 705 and Texas Highway 103, 1.1 miles east on Texas Highway 103, 1.0 mile north, northeast, and north on woods

road to an area with a small clearing on the east side of the road, 100 feet east along the northern edge of the clearing, and 70 feet south to site at the southern edge of the clearing. Norwood, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 24 minutes, 23.70 seconds N.; Longitude: 94 degrees, 8 minutes, 3.80 seconds W.

Ap—0 to 8 inches; brown (10YR 5/3) loam; 7 percent fine and medium prominent strong brown (7.5YR 4/6) and 3 percent fine and medium distinct grayish brown (2.5Y 5/2) mottles; weak fine subangular blocky structure parting to weak fine granular; friable, slightly hard, nonsticky, nonplastic; many fine and medium roots; common fine pores; slightly acid; abrupt wavy boundary.

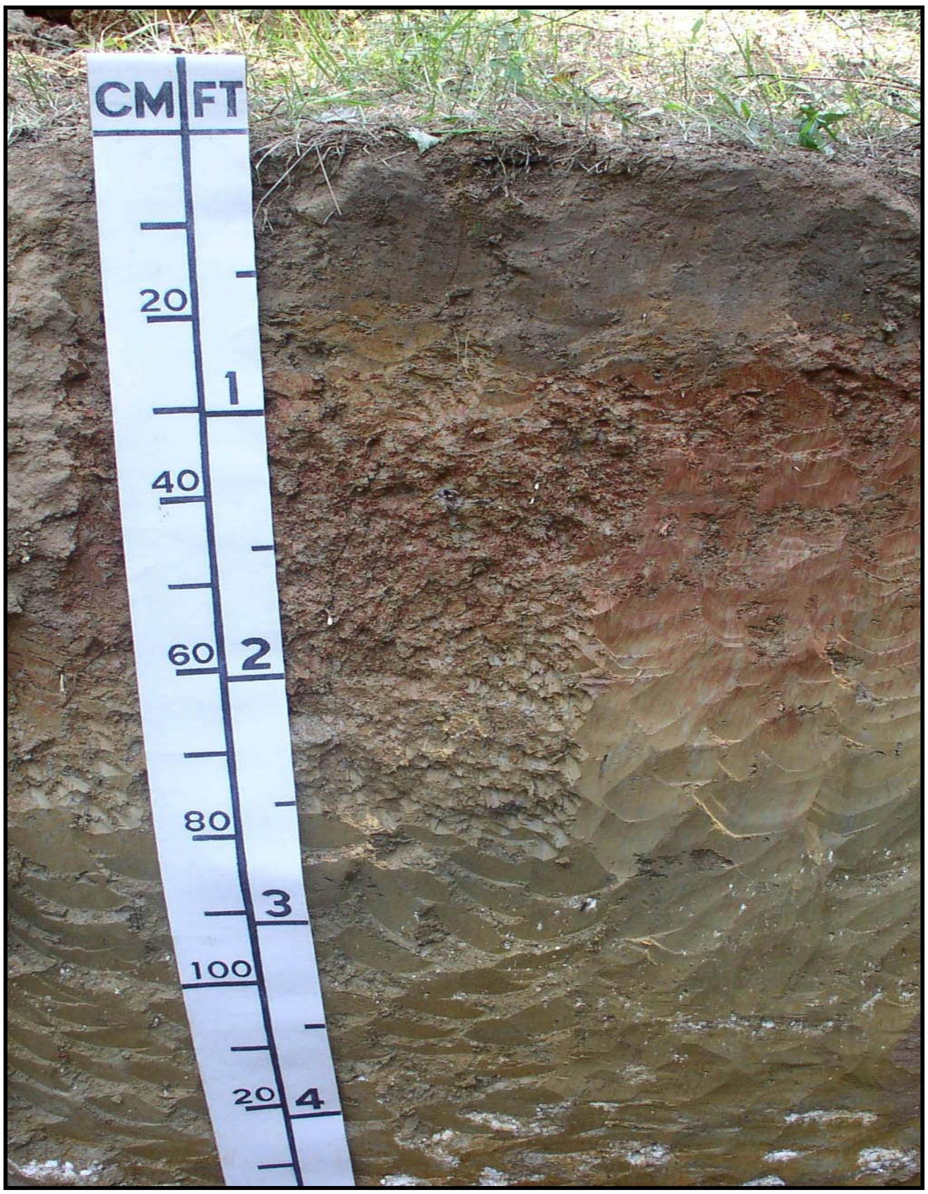


Figure 7.—Profile of Etoile loam in an area of Etoile loam, 1 to 5 percent slopes. Etoile soils have clayey subsoils, and formed over densic material.

Bt—8 to 24 inches; 50 percent red (2.5YR 4/6) and 40 percent yellowish brown (10YR 5/6) clay; 3 percent fine and medium prominent light brownish gray (2.5Y 6/2) mottles; weak medium angular blocky structure; very firm, very hard, moderately sticky, very plastic; common fine and medium roots; common fine pores; 25 percent clay films; moderately acid; clear wavy boundary.

Btss—24 to 32 inches; light olive brown (2.5Y 5/4) clay; 25 percent fine and medium distinct light olive gray (5Y 6/2), 7 percent fine and medium prominent yellowish brown (10YR 5/8), and 2 percent fine and medium prominent yellowish red (5YR 4/6) mottles; moderate medium angular blocky structure; extremely firm, extremely hard, very sticky, very plastic; common fine and medium roots; common fine pores; 25 percent clay films; 20 percent slickensides (pedogenic); 3 percent carbonate masses; neutral; gradual wavy boundary.

Btkss—32 to 51 inches; light olive brown (2.5Y 5/4) clay; 25 percent fine and medium distinct gray (2.5Y 5/1), and 1 percent fine prominent strong brown (7.5YR 5/6) mottles; weak medium angular blocky structure; very firm, very hard, very sticky, very plastic; common fine roots; 10 percent clay films; 20 percent slickensides (pedogenic); 2 percent iron-manganese masses; 12 percent carbonate masses; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd/Bt—51 to 65 inches; 55 percent strong brown (7.5YR 5/8) and 20 percent light olive gray (5Y 6/2) clay; 1 percent fine distinct strong brown (7.5YR 5/6) mottles; weak medium and coarse angular blocky structure; very firm, very hard, very sticky, very plastic; common fine roots; 5 percent pressure faces and 5 percent clay films; 2 percent fine and medium iron-manganese masses; 2 percent carbonate concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cdk—65 to 80 inches; reddish yellow (7.5YR 6/8) clay loam; 15 percent medium and coarse prominent light yellowish brown (2.5Y 6/3), and 2 percent fine and medium prominent dark reddish brown (2.5YR 3/4) mottles; massive; very firm, very hard, slightly sticky, slightly plastic; 2 percent slickensides (geogenic); 5 percent fine black (10YR 2/1) glauconite pellets with sharp boundaries; 1 percent fine and medium shell fragments; 15 percent coarse carbonate concretions; 15 percent very coarse carbonate masses; violently effervescent; strongly alkaline.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.

Mean annual soil temperature: 67 to 70 degrees F

Depth to argillic horizon: 4 to 29 inches

Solum thickness: 40 to 60 inches

Thickness of A and E horizons: Less than 10 inches, and ranges from 3 inches on subsoil crests to 14 inches in some subsoil troughs. E horizons may be absent in areas that have been plowed.

Depth calcium carbonate: 24 to 50 inches

Other features: The soil cracks when dry. Cracks 0.5-inch or more wide in the top of the argillic horizon extend to a depth of more than 12 inches for 60 to 90 cumulative days in normal years. Slickensides and/or wedge-shaped peds are in some subhorizons more than 6 inches thick within the argillic horizon.

Redoximorphic features: Considered relict or lithochromic

Clay content: 40 to 60 percent

Rock fragments: Amount—none to few; size—pebbles; kind—rounded quartzite or ironstone
Base saturation: 60 to 90 percent in the lower part of the argillic horizon

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Fine sandy loam, very fine sandy loam, or loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

E horizon (where present)

Hue: 10YR
Value: 5 or 6
Chroma: 2 to 4
Texture: Fine sandy loam, very fine sandy loam, or loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

Bt horizon

Hue: 2.5YR to 10YR
Value: 4 or 5
Chroma: 4 to 8. The colors are variable within a distance of a few feet
Lithochromic mottles: Amount—few to common; size—fine to coarse; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or gray
Texture: Clay
Reaction: Strongly acid or moderately acid (5.1 to 6.0), however, in some subsoil crests the reaction is slightly acid or neutral (6.1 to 7.3)

Btss or Btkss horizon

Color features: Shades of brown, gray, or olive
Lithochromic mottles: Amount—few to common; size—fine to coarse; contrast—faint to prominent; boundary—clear or diffuse; shades—red, yellow, or gray. Some subhorizons are variegated with these colors.
Texture: Clay
Calcium carbonate: Amount—none to few in the upper part, and from few to many in the lower part in most pedons; kind—films, masses, or concretions.
Calcium carbonate concretions: None to common masses or nodules
Slickensides and/or pressure faces: Few to common
Effervescence: Noneffervescent to strongly effervescent
Reaction: Slightly acid to moderately alkaline (6.1 to 7.8), but may also be moderately acid (5.6 to 6.0) in the upper part of the horizon in some pedons.

BCk, BCy, Cd/Bk horizon

Color features: Shades of brown, gray, or olive
Lithochromic mottles: Amount—few to common; size—fine to coarse; contrast—faint to prominent; boundary—clear or diffuse; shades—red, yellow, or gray. Some subhorizons are variegated with these colors. Calcium carbonate films, masses, or concretions range from none to few in the upper part, and from few to many in the lower part in most pedons.
Texture: Clay
Calcium carbonate concretions: Amount—few to common; kind—masses or nodules
Gypsum: Amount—few to common; kind—crystals
Effervescence: Noneffervescent to strongly effervescent

Reaction: Slightly acid to moderately alkaline (6.1 to 7.8), but may also be moderately acid (5.6 to 6.0) in the upper part of the horizon in some pedons.

Cd or CdK

Color features: Shades of brown, yellow, or gray or is varigated, bedded, or platy shale, or marl and shale with seams of clay or clay loam texture
Texture: Clay or clay loam
Calcium carbonate concretions: Few to many seams and/or masses
Effervescence: Very slightly effervescent to strongly effervescent
Reaction: Neutral to moderately alkaline (6.6 to 8.4)

Gallime Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium
Geology: Fluviatile terrace
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 0 to 3 percent

Associated Soils

Bernaldo soils do not have thick surface layers.
Besner soils are coarser textured.
Guyton and Mollville soils are wetter and gray throughout.
Laneville and Dreka soils are on flood plains.
Metcalf soils are somewhat poorly drained.

Taxonomic Classification

Fine-loamy, siliceous, semiactive, thermic Glossic Paleudalfs

Typical Pedon

Gallime very fine sandy loam in an area of Gallime very fine sandy loam, 1 to 3 percent slopes, in intermixed conifers and hardwoods; from the intersection of Farm Road 3172 and Farm Road 2694 in Huxley, approximately 1.25 miles south on Farm Road 3172 to intersection with U.S. Forest Service Road 100, 1.75 miles east on U.S. Forest Service Roads 100 and 100A towards Haley's Ferry, 120 feet south on logging road; 25 feet west of logging road in compartment #24 Sabine National Forest. Brushy Creek, Louisiana USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 44 minutes, 8.00 seconds N.; Longitude: 93 degrees, 50 minutes, 13.00 seconds W.

A—0 to 3 inches; brown (10YR 4/3) very fine sandy loam; weak medium subangular blocky structure; friable, soft; common fine and medium, and few coarse roots; strongly acid; clear smooth boundary.

E1—3 to 12 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium subangular blocky structure; friable, soft; common fine and medium roots; 1 percent 0.1- to 3.0-inch ironstone nodules; strongly acid; gradual smooth boundary.

E2—12 to 20 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium subangular blocky structure; friable, soft; common fine and medium roots; strongly acid; diffuse wavy boundary.

Bt1—20 to 24 inches; strong brown (7.5YR 5/6) and light yellowish brown (10YR 6/4) loam; moderate medium subangular blocky structure; friable, soft; 10 percent clay films on faces of peds; 4 percent light yellowish brown (10YR 6/4) clay depletions between peds; 5 percent medium brittle masses; 1 percent 0.1- to 3.0-inch ironstone nodules; strongly acid; clear wavy boundary.

Bt2—24 to 43 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm, slightly hard; common fine and medium, and few coarse roots; 10 percent continuous clay films on faces of peds; 1 percent fine distinct brownish yellow (10YR 6/6) iron depletions; 1 percent 0.1- to 0.5-inch ironstone nodules; strongly acid; gradual wavy boundary.

Bt/E—43 to 80 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; friable, slightly hard; few fine and medium pores; 10 percent discontinuous clay films on faces of peds; 13 percent very pale brown (10YR 7/3) clay depletions between peds; 10 percent coarse distinct yellowish red (5YR 5/6) masses of oxidized iron; 2 percent 0.1- to 0.5-inch ironstone nodules; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 20 to 40 inches
Solum thickness: More than 80 inches
Thickness of epipedon: 20 to 40 inches
Clay content: 18 to 25 percent
CEC/clay ratio: 0.24 to 0.40
Base saturation: 35 to 60 percent in the lower part of the argillic horizon

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, horizons with value of 3 are less than 7 inches thick
Chroma: 2 to 4
Texture: Fine sandy loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5), unless limed

E horizon

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 2 to 4
Texture: Fine sandy loam, very fine sandy loam, or loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5), unless limed

Bt horizon

Hue: 5YR to 10YR
Value: 5 or 6
Chroma: 4 to 8
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray

Other *features:* The upper Bt horizon of some pedons do not contain redoximorphic concentrations. Redoximorphic depletions typically occur below depths of 30 to about 65 inches.
Texture: Loam or sandy clay loam
Brittle masses: 0 to 15 percent
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bt/E horizon

Color features: Shades of brown, red, yellow, and gray
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray
Texture: Loam, sandy clay loam, or clay loam
Albic material (E): Amount—5 to 20 percent by volume; kind—streaks, pockets, and coatings; location—on faces of peds
Brittle masses: Make up about 5 to 20 percent of most pedons. Some pedons have a few nodular fragments of plinthite that make up less than 4 percent by volume.
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Grapeland Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex areas
Parent material: Sandy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Somewhat excessively drained
Saturated hydraulic conductivity class: Rapid
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 1 to 5 percent

Associated Soils

Betis soils have brown subsoils.
Darco soils have a continuous subsoil below 40 inches.
Iulus and Owentown soils are on flood plains.
Kirvin and Cuthbert soils have red clayey subsoils.
Lilbert, Rentzel, and Tenaha soils have loamy subsoils.

Taxonomic Classification

Siliceous, thermic Psammentic Paleudults

Typical Pedon

Grapeland loamy fine sand in an area of Grapeland loamy fine sand, 1 to 5 percent slopes, in tame pastureland; from the intersection of Farm Road 711 and Texas Highway 7 southwest of Center, approximately 5.6 miles south on Farm Road 711 to intersection with County Road 1286, 100 feet west on County Road 1286, and 20 feet south between road and fenceline. Mount Herman, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 39 minutes, 51.20 seconds N.; Longitude: 94 degrees, 15 minutes, 17.70 seconds W.

Ap—0 to 6 inches; brown (10YR 4/3) loamy fine sand; single grain; loose, loose; many fine and medium roots; strongly acid; clear smooth boundary.
Bt1—6 to 30 inches; yellowish red (5YR 4/6) loamy fine sand; weak fine subangular blocky structure; very friable, soft; many fine and medium roots; 2 percent clay bridges between sand grains; very strongly acid; gradual smooth boundary.
Bt2—30 to 68 inches; yellowish red (5YR 5/6) loamy fine sand; weak fine subangular blocky structure; very friable, soft; many medium roots; 2 percent clay bridges between sand grains; very strongly acid; gradual smooth boundary.
Bt3—68 to 80 inches; yellowish red (5YR 5/8) loamy fine sand; weak fine subangular blocky structure; very friable, soft; common medium roots; 2 percent clay bridges between sand grains; 5 percent very pale brown (10YR 7/3) clean sand spots; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil is dry in some part of the moisture control section for 75 to 90 days in most years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 3 to 32 inches
Solum thickness: More than 80 inches
Rock fragments: Amount—none to few; kind—rounded ironstone nodules; size—less than 0.5-inch across
Base saturation: 35 to 60 percent
Reaction: Extremely acid to strongly acid (3.5 to 5.5), unless limed

A or Ap horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 3 or 4
Texture: Loamy fine sand

Bt horizon

Hue: 2.5YR or 5YR
Value: 4 to 6
Chroma: 6 or 8
Texture: Loamy sand or loamy fine sand; the Bt horizon contains at least 3 percent more clay than the horizon above
Other features: 0 to 5 percent streaks and spots of uncoated sand

Bt and E horizon (where present)

Hue: 2.5YR to 7.5YR
Value: 4 to 6
Chroma: 6 or 8
Texture: Fine sand, loamy sand, or loamy fine sand
Other features: 5 to 50 percent streaks and spots of uncoated sand

Guyton Series

MLRA: Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Flat depressions
Parent material: Loamy alluvium
Drainage class: Poorly drained
Saturated hydraulic conductivity class: Slow

Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 1 percent

Associated Soils

Besner soils have coarse-loamy control sections.
Gallime soils have fine-loamy control sections.

Taxonomic Classification

Fine-silty, siliceous, active, thermic Typic Glossaqualfs

Typical Pedon

Guyton silt loam in an area of Guyton-Sawtown complex, mounded, in hardwoods; from the intersection of Texas Highway 147 and Farm Road 2851 south of Broaddus, approximately 0.55 mile northeast on Texas Highway 147 to intersection with access road (Buffalo Trail), 150 feet west on access road, and 30 feet north of road in compartment #27 Angelina National Forest. Broaddus, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 15 minutes, 55.61 seconds N.; Longitude: 94 degrees, 18 minutes, 0.89 seconds W.

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure; friable, soft; few fine, few medium, and few coarse roots; few fine and few medium pores; 8 percent fine and medium distinct dark yellowish brown (10YR 4/6) masses of oxidized iron in matrix, and 1 percent dark yellowish brown (10YR 3/6) masses of oxidized iron on surfaces along root channels; 1 percent medium faint dark grayish brown (10YR 4/2) iron depletions; very strongly acid; gradual wavy boundary.

Eg—7 to 16 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure; friable, soft; few fine, few medium, and few coarse roots; common fine and common medium pores; 8 percent medium and coarse distinct brownish yellow (10YR 6/6) masses of oxidized iron in matrix, and 1 percent fine faint yellowish brown (10YR 5/6) masses of oxidized iron; 1 percent brownish yellow (10YR 6/6) masses of oxidized iron on surfaces along root channels; very strongly acid; clear irregular boundary.

Btg/E—16 to 32 inches; grayish brown (10YR 5/2) silty clay loam; weak medium subangular blocky structure; firm, slightly hard; few fine and few medium roots; 10 percent by volume krotovinas; 15 percent clay films; 30 percent light gray (10YR 7/2) skeletans; 8 percent medium and coarse faint yellowish brown (10YR 5/6), and 1 percent strong brown (7.5YR 5/6) masses of oxidized iron; very strongly acid; gradual wavy boundary.

Btg—32 to 80 inches; grayish brown (10YR 5/2) silty clay loam; weak medium subangular blocky structure; firm, slightly hard; common fine and common medium roots; 15 percent clay films; 4 percent skeletans; 1 percent strong brown (7.5YR 5/6) masses of oxidized iron; 10 percent fine distinct light brownish gray (2.5Y 6/2) iron depletions; 5 percent barite masses; very strongly acid.

Range in Characteristics

Soil moisture: An aquic soil moisture regime. The soil is dry in the moisture control section for 50 cumulative days or more in most years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 11 to 35 inches
Solum thickness: 50 to 80 inches
Clay content: 18 to 30 percent, the clay content decreases by 20 percent or more from the maximum within a depth of 40 to 60 inches

Sand content: 10 to 40 percent, dominantly very fine sand
Exchangeable sodium: 0 to 40 percent in the lower part of the solum
CEC/clay ratio: 0.40 to 0.60
Base saturation: 60 to 90 percent

A or Ap horizon

Hue: 10YR or 2.5Y
Value: 3 to 6, horizons with value of 3 are less than 6 inches thick
Chroma: 2 or 3
Texture: Silt loam
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Eg horizon

Hue: 10YR or 2.5Y
Value: 5 to 8
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—brown
Texture: Silt loam, loam, or very fine sandy loam
Other features: The lower boundary of the Eg horizon is clear irregular or abrupt irregular and steaks and pockets of Eg material extend into the Btg horizon.
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Btg or Btg/E horizon

Hue: 10YR or 2.5Y
Value: 5 or 6
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—brown or gray
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray
Texture: Silt loam, silty clay loam, or clay loam
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

BC horizon (where present)

Hue: 10YR or 2.5Y
Value: 5 or 6
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—brown or gray
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray
Texture: Silt loam, silty clay loam, clay loam, or sandy clay loam
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Cg horizon (where present)

Hue: 10YR or 2.5Y
Value: 5 or 6
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—brown or gray
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray

Texture: Silt loam, silty clay loam, clay loam, or sandy clay loam
Reaction: Strongly acid to moderately alkaline (5.1 to 8.4)

Hainesville Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Alluvial fans; stream terraces
Parent material: Sandy alluvium
Geology: Pleistocene sediments
Drainage class: Somewhat excessively drained
Saturated hydraulic conductivity class: Moderately rapid
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 2 percent

Associated Soils

Mollville soils have more wetness and are in lower positions
Sawlit soils have slightly more wetness.

Taxonomic Classification

Thermic, coated Lamellic Quartzipsamments

Typical Pedon

Hainesville loamy fine sand in an area of Hainesville loamy fine sand, 0 to 2 percent slopes, in other grass/herbaceous cover; from the junction of U.S. Highway 69 and U.S. Highway 287 in Woodville, 12.3 miles east on U.S. Highway 190, 7 miles north on Farm Road 92, continuing to County Road 3725 to Temple-Inland entrance, 1.35 miles north and east on woodland road to hunting site 42 (D. Wersig), 60 feet north on hunter's trail, and 10 feet west in woods (entrance to site). Pace Hill, Texas USGS 7.5-minute topographic quadrangle; Latitude: 30 degrees, 56 minutes, 17.10 seconds N.; Longitude: 94 degrees, 13 minutes, 54.60 seconds W.

A—0 to 2 inches; pale brown (10YR 6/3) loamy fine sand; 15 percent medium distinct yellowish brown (10YR 5/6) mottles; very friable, soft, nonsticky, nonplastic; moderately acid; clear smooth boundary.

Bw—2 to 7 inches; brown (10YR 5/3) loamy fine sand; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; moderately acid; gradual wavy boundary.

Bw/E1—7 to 22 inches; 20 percent very pale brown (10YR 7/3) and yellowish brown (10YR 5/6) loamy fine sand; 25 percent medium distinct yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; lamellae; strongly acid; gradual wavy boundary.

Bw/E2—22 to 41 inches; 70 percent brownish yellow (10YR 6/6) and 10 percent very pale brown (10YR 7/3) broken face loamy fine sand; 20 percent medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; very friable, soft, nonsticky, nonplastic; lamellae; strongly acid; gradual wavy boundary.

Bw/E3—41 to 53 inches; yellowish brown (10YR 5/6) loamy fine sand; 25 percent medium distinct dark yellowish brown (10YR 4/6) mottles; weak fine granular structure; very friable, soft, nonsticky, nonplastic; strongly acid; gradual wavy boundary.

Bw/E4—53 to 70 inches; 45 percent yellowish brown (10YR 5/6), 45 percent light yellowish brown (10YR 6/4), broken face, and 10 percent very pale brown (10YR 7/3) broken face, loamy fine sand; weak medium subangular blocky structure; very friable, soft, nonsticky, nonplastic; strongly acid; gradual wavy boundary.

Bw/E5—70 to 80 inches; strong brown (7.5YR 5/6) loamy fine sand; weak medium subangular blocky structure; very friable, soft, nonsticky, nonplastic; lamellae; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for 60 to 90 cumulative days in most years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 40 to 72 inches
Solum thickness: More than 80 inches
Clay content: 2 to 10 percent
Rock fragments: Very few to about 3 percent rounded quartzite or ironstone pebbles in most pedons
Other features: Lamellae are within a depth of 40 to 72 inches

A or Ap horizon

Hue: 7.5YR or 10YR
Value: 3 to 6
Chroma: 3 or 4
Texture: Loamy fine sand
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bw horizon (where present)

Hue: 7.5YR or 10YR
Value: 5 to 8
Chroma: 3 or 4
Texture: Loamy fine sand
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bw/E horizon (where present)

Hue: Bw part—5YR to 10YR; E part—7.5YR or 10YR
Value: Bw part—5 to 7; E part—5 to 8
Chroma: Bw part—6 or 8; E part—3 or 4
Texture: Fine sand or loamy fine sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bw or Bt and E horizon (where present)

Hue: Bt part—5YR to 10YR
Value: Bt part—5 to 7
Chroma: Bt part—6 or 8
Texture: Fine sand or loamy fine sand; lamellae have texture of loamy fine sand or fine sandy loam.
Lamellic features: 0.1 to 1 inch thick and the cumulative thickness is less than 6 inches. They are in shades of red or brown.
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Hannahatchee Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands

Landscape: Coastal plains
Landforms: Flood plains
Position on landform: Linear or concave areas
Parent material: Loamy alluvium
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 1 percent

Associated Soils

Iulus soils have coarse-loamy control sections.
Mattex soils gray and loamy throughout.
Tuscosso soils are clayey.

Taxonomic Classification

Fine-loamy, siliceous, active, thermic Dystric Fluventic Eutrochrepts

Typical Pedon

Hannahatchee loam in an area of Hannahatchee loam, 0 to 1 percent slopes, occasionally flooded, in intermixed conifers and hardwoods; from the intersection of Texas Highway 21 and Texas Highway 147 in San Augustine, 2.2 miles east on Texas Highway 21 to intersection with County Road 127, approximately 0.6 mile north on County Road 127, approximately 1.3 miles east and northeast on logging road, approximately 300 feet northeast into flood plain on east side of channel. San Augustine East, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 32 minutes, 3.50 seconds N.; Longitude: 94 degrees, 2 minutes, 53.80 seconds W.

A—0 to 4 inches; dark reddish brown (5YR 3/4) loam; weak fine subangular blocky structure; friable, soft; few fine and few medium roots; slightly acid; gradual smooth boundary.

Bw1—4 to 25 inches; reddish brown (2.5YR 4/4) loam; moderate medium subangular blocky structure; friable, slightly hard; few fine and few medium roots; moderately acid; gradual smooth boundary.

Bw2—25 to 35 inches; red (2.5YR 4/6) clay loam; moderate medium subangular blocky structure; firm, hard; 1 percent fine iron-manganese nodules; moderately acid; gradual smooth boundary.

Bw3—35 to 50 inches; red (2.5YR 4/6) clay loam; moderate medium subangular blocky structure; firm, hard; 5 percent fine prominent light olive brown (2.5Y 5/4) iron depletions with diffuse boundaries; 5 percent medium prominent light olive brown (2.5Y 5/4) iron depletions with diffuse boundaries; 4 percent fine iron-manganese nodules; moderately acid; gradual smooth boundary.

Bw4—50 to 62 inches; red (2.5YR 4/6) and light olive brown (2.5Y 5/4) clay loam; moderate medium subangular blocky structure; firm, hard; 1 percent fine distinct light brownish gray (10YR 6/2) iron depletions with diffuse boundaries; 1 percent fine iron-manganese nodules; moderately acid; gradual smooth boundary.

Bw5—62 to 80 inches; reddish brown (5YR 4/4) and strong brown (7.5YR 4/6) and light brownish gray (10YR 6/2) sandy clay loam; moderate medium subangular blocky structure; firm, hard; moderately acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.

Mean annual soil temperature: 67 to 70 degrees F
Solum thickness: More than 80 inches
Clay content: 18 to 25 percent, the clay content decreases by 20 percent or more from the maximum within a depth of 40 to 60 inches
Rock fragments: Ironstone pebbles range from 0 to 5 percent throughout
CEC/clay ratio: 0.40 to 0.60
Base saturation: 60 or greater in some subhorizon at a depth of 10 to 30 inches
Redoximorphic features: Iron depletions in shades of gray, and iron concentrations in shades of red, brown, or yellow range from few to common at 40 to 60 inches deep.
Iron-manganese concretions: Amount—0 to 5 percent; location—throughout
Organic carbon: 0.2 to 0.4 percent at a depth of 50 inches below the soil surface
Other features: Amount—0 to 5 percent; kind—ironstone pebbles and iron-manganese concretions; location—throughout

A horizon

Hue: 5YR to 10YR
Value: 3 or 4
Chroma: 2 to 8
Texture: Loam
Reaction: Moderately acid to neutral (5.6 to 7.3)

Bw horizon

Hue: 2.5YR to 7.5YR
Value: 3 to 5
Chroma: 4 to 6
Color features: Some lower subhorizons have a mixed matrix in shades of red, brown, and olive
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red, brown, or yellow, at depths of 40 to 60 inches
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray, at depths of 40 to 60 inches
Texture: Fine sandy loam, loam, sandy clay loam, or clay loam
Reaction: Moderately acid to neutral (5.6 to 7.3)

Ab horizon (where present)

Hue: 7.5YR or 10YR
Value: 3 or 4
Chroma: 2 or 3
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—red, brown, or yellow, at depths of 40 to 60 inches
Redoximorphic depletions: Amount—none to common; size—fine to medium; contrast—distinct to prominent; boundary—clear to diffuse; shades—gray, at depths of 40 to 60 inches
Texture: Fine sandy loam to sandy clay loam
Other features: Depth to a buried A horizon is more than 40 inches
Reaction: Moderately acid to neutral (5.6 to 7.3)

Herty Series

MLRA: 133B—Western Coastal Plain

Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Clayey residuum weathered from mudstone
Geology: Caddell Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to paralithic bedrock
Shrink-swell potential: High
Slope: 0 to 3 percent

Associated Soils

Koury soils are coarse-loamy soils on the flood plains.
Kurth soils have fine-loamy control sections.
Moswell soils have very-fine control sections.

Taxonomic Classification

Fine, smectitic, thermic Oxyaquic Vertic Hapludalfs

Typical Pedon

Herty loam in an area of Herty loam, 0 to 3 percent slopes, in intermixed conifers and hardwoods; from the intersection of Farm Road 3173 and Farm Road 705, approximately 0.8 mile north on Farm Road 705 to U.S. Forest Service Number 359; 0.4 mile west to intersection with U.S. Forest Service 359A, 0.3 mile south on U.S. Forest Service 359A, and 50 feet east of road in compartment #41 Angelina National Forest (346 feet from curve in road). Veach, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 11 minutes, 6.50 seconds N.; Longitude: 94 degrees, 8 minutes, 43.10 seconds W.

Ap—0 to 2 inches; brown (10YR 4/3) loam; weak medium subangular blocky structure; friable, slightly hard; moderately acid; clear smooth boundary.

E—2 to 7 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable, slightly hard; strongly acid; clear smooth boundary.

Btg—7 to 20 inches; dark gray (10YR 4/1) clay; weak medium subangular blocky structure; very firm, very hard; clay films; 5 percent medium prominent yellowish brown (10YR 5/8) masses of oxidized iron; 4 percent light gray (10YR 7/2) clean sand; strongly acid; gradual wavy boundary.

Btssg—20 to 31 inches; gray (10YR 5/1) clay; weak medium angular blocky structure; extremely firm, extremely hard; slickensides (pedogenic); 5 percent medium prominent red (2.5YR 5/6), and 1 percent medium prominent red (2.5YR 4/8) masses of oxidized iron; 1 percent fine faint gray (2.5Y 6/1) iron depletions; strongly acid; gradual wavy boundary.

BCssy—31 to 45 inches; light yellowish brown (2.5Y 6/3) clay; weak medium subangular blocky structure parting to massive; extremely firm, extremely hard; 2 percent slickensides (pedogenic); 5 percent medium distinct red (2.5YR 5/6) masses of oxidized iron; 2 percent gypsum masses; strongly acid; gradual smooth boundary.

2Cy—45 to 60 inches; light yellowish brown (2.5Y 6/3) stratified clay; massive; 5 percent medium distinct brownish yellow (10YR 6/6) masses of oxidized iron; 5 percent medium distinct brown (7.5YR 5/4) masses of oxidized iron; 2 percent gypsum masses; siltstone fragments and shale fragments; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is dry in some or all parts for 60 to 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to paralithic contact: 40 to 60 inches
Combined thickness of A and E horizons: 3 to 10 inches
Depth to argillic horizon: 3 to 10 inches
Depth to gypsiferous materials: 20 to 60 inches
Depth to gypsic horizon: 30 to 44 inches
Depth to redoximorphic concentrations: 3 to 20 inches. Redoximorphic features are both relict and contemporary.
Depth to episaturation: 3 to 20 inches. The soil does not have aquic conditions in normal years. The soil is seasonally wet in the surface layer and upper part of the Btg1.
Exchangeable sodium: 8 to 20 percent
Depth to vertic features: 12 to 26 inches to slickensides or wedge-shaped peds
Solum thickness: 40 to 60 inches
Clay content: 35 to 45 percent
Rock fragments: 0 to 2 percent

A or Ap horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Loam
Clay content: 5 to 15 percent
Rock fragments: 0 to 2 percent
EC (dS/m): 0 to 2
Sodium adsorption ratio: 0 to 4
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E horizon

Hue: 10YR
Value: 5 or 6
Chroma: 1 to 3
Texture: Loam
Clay content: 5 to 15 percent
Rock fragments: 0 to 2 percent
EC (dS/m): 0 to 2
Sodium adsorption ratio: 0 to 4
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Btg horizon

Hue: 10YR or 2.5Y
Value: 4 to 6
Chroma: 1 or 2
Texture: Clay loam, silty clay loam, or clay
Clay content: 35 to 45 percent
Clay films: Location—on faces of peds; contrast—faint to prominent
Redoximorphic concentrations: Amount—few to common; size—fine to coarse; contrast—faint to prominent; boundary—sharp to diffuse; location—in matrix and on faces of peds; shades—red or brown
Rock fragments: 0 to 2 percent
Gypsum: 0 to 2 percent

Salinity: Nonsaline to slightly saline
EC (dS/m): 0 to 4
Sodium adsorption ratio: 6 to 13
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Btssg horizon

Hue: 10YR or 2.5Y
Value: 4 to 6
Chroma: 1 or 2
Texture: Silty clay or clay
Clay content: 35 to 45 percent
Clay films: Location—on faces of peds; contrast—faint to prominent
Slickensides: Few to common
Redoximorphic concentrations: Amount—few to common; size—fine to coarse; contrast—faint to prominent; boundary—sharp to clear; location—in matrix and on faces of peds; shades—red or brown
Rock fragments: 0 to 2 percent
Gypsum: 2 to 35 percent
Salinity: Nonsaline to slightly saline
EC (dS/m): 2 to 8
Sodium adsorption ratio: 6 to 13
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Btssy or BCssy horizon

Color features: Brown, yellow, or olive
Texture: Clay or silty clay
Clay content: 40 to 60 percent
Clay films: Location—on faces of peds; contrast—faint to prominent
Slickensides: Few to common
Redoximorphic concentrations: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—clear or sharp; location—in matrix; shades—brown or yellow
Redoximorphic depletions: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—clear or sharp; location—in matrix; shades—gray or olive
Gypsum: 2 to 35 percent
Salinity: Very slightly saline to moderately saline
EC (dS/m): 2 to 8
Sodium adsorption ratio: 6 to 13
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

2Cd or 2Cy horizon

Color features: Brown, olive, or gray
Texture: Mudstone or shale with a texture of clay loam or clay
Clay content: 35 to 70 percent
Gypsum: 2 to 35 percent
EC (dS/m): 4 to 8
Sodium adsorption ratio: 8 to 13
Reaction: Extremely acid to slightly acid (3.6 to 6.5)

Iulus Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands

Landforms: Flood plains
Landscape: Coastal plains
Position on landform: Concave, convex, or linear areas
Parent material: Loamy alluvium
Geology: Holocene sediments
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 1 percent

Associated Soils

Bowie soils have argillic horizons and are on uplands.
Cuthbert soils have argillic horizons and are on uplands.
Hannahatchee soils have fine-loamy control sections.
Kirvin soils have argillic horizons and are on uplands.
Lilbert soils have sandy surfaces more than 20 inches thick and are on interfluves.
Mantachie are poorly drained soils in lower positions.
Tenaha soils have sandy surfaces more than 20 inches thick and are on side slopes.

Taxonomic Classification

Coarse-loamy, siliceous, active, thermic Fluvaquentic Dystrochrepts

Typical Pedon

Iulus fine sandy loam in an area of Iulus fine sandy loam, 0 to 1 percent slopes, frequently flooded, in hayland; from Texas Highway 49 and Farm Road 134 in Jefferson, 3 miles east on Texas Highway 49, 2.3 miles north on Farm Road 248, and 125 feet west in meadow. Jefferson, Texas USGS 7.5-minute topographic quadrangle; Latitude: 32 degrees, 49 minutes, 21.72 seconds N.; Longitude: 94 degrees, 19 minutes, 2.05 seconds W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine and medium granular structure; friable, slightly hard; many fine and medium, and common coarse roots; common fine tubular pores; few medium distinct strong brown (7.5YR 4/6) ironstone pebbles; strongly acid; gradual smooth boundary.

Bw1—8 to 15 inches; 60 percent dark yellowish brown (10YR 4/4), 20 percent yellowish brown (10YR 5/4), and 10 percent yellowish brown (10YR 5/6) fine sandy loam; weak fine and medium subangular blocky structure; friable, slightly hard; common fine and medium, and few coarse roots; common fine and medium tubular, and few coarse tubular pores; 10 percent medium faint grayish brown (10YR 5/2) iron depletions; very strongly acid; clear wavy boundary.

Bw2—15 to 24 inches; 55 percent yellowish brown (10YR 5/4), 10 percent yellowish brown (10YR 5/6), and 10 percent dark yellowish brown (10YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; friable, slightly hard; common fine and medium, and few coarse roots; common fine and medium tubular, and common coarse tubular pores; 3 percent discontinuous faint yellowish brown (10YR 5/8) iron stains on rock fragments; 25 percent faint grayish brown (10YR 5/2) iron depletions; 1 percent fine and medium spherical wormcasts; very strongly acid; clear wavy boundary.

Bw3—24 to 37 inches; 40 percent yellowish brown (10YR 5/6), 20 percent yellowish brown (10YR 5/4), and 10 percent strong brown (7.5YR 5/6) very fine sandy loam; 30 percent faint grayish brown (10YR 5/2) mottles; weak fine and medium subangular blocky structure; friable, slightly hard; common fine, few medium, and few coarse roots; common fine, and few medium, and few coarse tubular pores; 30 percent faint grayish brown (10YR 5/2) iron

depletions; 1 percent fine and medium spherical iron-manganese concretions; very strongly acid; clear wavy boundary.

Bg—37 to 53 inches; 90 percent light brownish gray (10YR 6/2) very fine sandy loam; weak coarse subangular blocky structure; very friable, slightly hard; common fine, few medium, and few coarse roots; common fine, few medium, and few coarse tubular pores; 5 percent distinct yellowish brown (10YR 5/6) ironstone nodules; 3 percent distinct strong brown (7.5YR 5/6) ironstone nodules; 2 percent distinct dark yellowish brown (10YR 3/4) ironstone nodules; 2 percent fine and medium spherical iron-manganese concretions; 1 percent fine and medium spherical ironstone nodules; 1 percent coarse spherical iron-manganese concretions; very strongly acid; clear wavy boundary.

B'w1—53 to 64 inches; 60 percent dark yellowish brown (10YR 4/6) and 20 percent yellowish brown (10YR 5/6) very fine sandy loam; weak coarse subangular blocky structure; very friable, slightly hard; few fine roots; few fine and medium tubular pores; 20 percent distinct light brownish gray (10YR 6/2) iron depletions; 8 percent medium and coarse spherical iron-manganese concretions; very strongly acid; clear wavy boundary.

B'w2—64 to 80 inches; 50 percent yellowish brown (10YR 5/4) and 20 percent yellowish brown (10YR 5/6) fine sandy loam; 30 percent faint light brownish gray (10YR 6/2) mottles; weak coarse subangular blocky structure; very friable, slightly hard; common fine and medium tubular pores; 30 percent faint light brownish gray (10YR 6/2) iron depletions; 2 percent medium spherical iron-manganese concretions; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is dry in some part for more than 60 cumulative days in most years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 4 to 29 inches
Solum thickness: More than 80 inches
Other distinctive soil features: Thickness of the loamy alluvial sediments ranges from 7 to 14 feet
Clay content: 10 to 18 percent
Rock fragments: Rounded quartzite or ironstone pebbles range from none to few
CEC/clay ratio: 0.40 to 0.60
Base saturation: 60 to 90 percent in the lower part of the argillic horizon
Redoximorphic features: Iron concentrations in shades of brown and iron depletions in shades of gray begin within a depth of 24 inches.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 to 4
Redoximorphic concentrations: Amount—few; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—brown
Redoximorphic depletions: Amount—few; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray
Texture: Fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 or 5
Chroma: 3 to 8

Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear to diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray, within a depth of 24 inches from the surface
Texture: Fine sandy loam or loam in the upper part, but ranges to sandy clay loam in the lower part of some pedons, or it is stratified with these textures. Some pedons have thin subhorizons that are silt loam, very fine sandy loam, or loamy fine sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bg horizon

Color features: Shades of brown or gray, with chroma of 2 or less.
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear to diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray, within a depth of 24 inches from the surface, or the Bg horizon in some pedons is variegated with these colors.
Texture: Fine sandy loam, very fine sandy loam, loam, silt loam, or sandy clay loam. Most pedons have more than one texture and some pedons have thin strata of loamy fine sand. Horizons with more than 18 percent clay are common in the lower part or below the particle-size control section.
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Ab horizon (where present)

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 to 4
Redoximorphic concentrations: Amount—few; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—brown
Redoximorphic depletions: Amount—few; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray
Texture: Fine sandy loam, very fine sandy loam, or loam
Reaction: Very strongly acid to moderately acid (3.6 to 6.0)

B'w horizon (where present)

Hue: 7.5YR or 10YR
Value: 4 or 5
Chroma: 3 to 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear to diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray, within a depth of 24 inches from the surface
Texture: Fine sandy loam, loam, or sandy clay loam, or it is stratified with these textures. Some pedons have thin subhorizons that are silt loam, very fine sandy loam, or loamy fine sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Kawah Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Drainageways

Geomorphic positions, three-dimensional: Base slope
Position on hillslope: Concave or linear base slopes
Parent material: Sandy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Somewhat poorly drained
Saturated hydraulic conductivity class: Rapid
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 2 percent

Associated Soils

Darco soils have sandy surface layers more than 40 to 80 inches thick, and a subsoil. Tonkawa soils are Quartzipsamments without redoximorphic features.

Taxonomic Classification

Thermic, coated Aquic Quartzipsamments

Typical Pedon

Kawah fine sand in an area of Kawah fine sand, 0 to 2 percent slopes, in intermixed conifers and hardwoods; from the intersection of U.S. Highway 96 and Farm Road 1279 north of San Augustine, 1.1 miles north on U.S. Highway 96, 400 feet east on timber company access road, 0.35 mile north on logging road, and 200 feet west of road in timber. San Augustine West, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 35 minutes, 57.30 seconds N.; Longitude: 94 degrees, 8 minutes, 36.40 seconds W.

Ap—0 to 10 inches; dark gray (10YR 4/1) fine sand; single grain; loose, loose; strongly acid; clear smooth boundary.
A2—10 to 22 inches; dark grayish brown (10YR 4/2) fine sand; single grain; very friable, loose; strongly acid; clear smooth boundary.
Cg1—22 to 60 inches; light brownish gray (10YR 6/2) fine sand; single grain; very friable, loose; 1 percent fine distinct brownish yellow (10YR 6/6) masses of oxidized iron; extremely acid; gradual smooth boundary.
Cg2—60 to 75 inches; gray (10YR 6/1) fine sand; single grain; very friable, loose; 1 percent fine distinct yellowish brown (10YR 5/4) masses of oxidized iron; extremely acid; gradual smooth boundary.
Cg3—75 to 80 inches; light gray (10YR 7/1) fine sand; single grain; very friable, loose; 1 percent fine distinct yellowish brown (10YR 5/4) masses of oxidized iron; extremely acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 69 degrees F
Depth to redoximorphic concentrations: 4 to 80 inches
Depth to redoximorphic depletions: 18 to 36 inches
Depth to endosaturation: 18 to 36 inches
Solum thickness: More than 80 inches
Clay content: 1 to 5 percent
Silt plus clay: 5 to 10 percent

A or Ap horizon

Hue: 10YR
Value: 4 or 5
Chroma: 1 or 2

Texture: Fine sand
Clay content: 1 to 5 percent
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

Cg horizon

Hue: 10YR
Value: 6 to 8
Chroma: 1 or 2
Texture: Sand or fine sand
Clay content: 1 to 5 percent
Redoximorphic concentrations: Amount—none to few; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; location—in matrix; shades—red, brown, or yellow
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Kirvin Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Ridges
Position on hillslope: Convex or linear crests
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Sparta Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Deep to densic material
Shrink-swell potential: Moderate
Slope: 1 to 8 percent

Associated Soils

Bowie soils have fine-loamy control sections.
Cuthbert soils have sola 20 to 40 inches thick.
Tenaha soils have sandy surfaces more than 20 inches thick.

Taxonomic Classification

Fine, mixed, semiactive, thermic Typic Hapludults

Typical Pedon

Kirvin fine sandy loam in an area of Kirvin fine sandy loam, 1 to 5 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 21 and Farm Road 3409 west of San Augustine, approximately 2.2 miles south on Farm Road 3409 to end of pavement, and 50 feet west of road in timber. Norwood, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 29 minutes, 27.20 seconds N.; Longitude: 94 degrees, 13 minutes, 34.60 seconds W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure parting to weak medium granular; friable, soft; strongly acid; clear wavy boundary.

E—7 to 12 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure parting to weak medium granular; friable, soft; strongly acid; clear wavy boundary.

Bt1—12 to 19 inches; yellowish red (5YR 4/6) clay; 1 percent fine faint reddish yellow (5YR 6/8) mottles; moderate medium subangular blocky structure; firm, moderately hard; 15 percent clay films; very strongly acid; gradual wavy boundary.

Bt2—19 to 33 inches; red (2.5YR 4/8) clay; 5 percent fine and medium distinct strong brown (7.5YR 5/8), and 1 percent coarse distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, hard; 15 percent clay films; very strongly acid; gradual wavy boundary.

Bt3—33 to 40 inches; red (2.5YR 4/6) clay; 5 percent fine and medium prominent light brownish gray (10YR 6/2), 5 percent fine and medium prominent pale brown (10YR 6/3), and 1 percent fine prominent reddish yellow (7.5YR 6/8) mottles; moderate medium subangular blocky structure; firm, hard; 20 percent clay films; very strongly acid; gradual wavy boundary.

BtC—40 to 51 inches; strong brown (7.5YR 5/8), red (2.5YR 4/6), and light gray (10YR 7/2) clay; moderate fine subangular blocky structure parting to massive; firm, hard; 7 percent clay films; very strongly acid; gradual wavy boundary.

CBt—51 to 57 inches; red (2.5YR 4/8), strong brown (7.5YR 5/8), and light gray (10YR 7/2) sandy clay loam; massive parting to weak medium subangular blocky; firm, moderately hard; 2 percent clay films; very strongly acid; clear smooth boundary.

Cd—57 to 80 inches; strong brown (7.5YR 5/8) sandy clay loam; 5 percent fine and medium distinct red (2.5YR 4/6) and 5 percent fine and medium prominent light gray (10YR 7/2) mottles; massive; friable, moderately hard; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for as long as 90 cumulative days in normal years.
Mean annual soil temperature: 66 to 70 degrees F
Depth to argillic horizon: 3 to 20 inches
Depth to redoximorphic concentrations: 13 to 30 inches
Solum thickness: 40 to 60 inches
Depth to densic layer: 40 to 60 inches
Clay content: 35 to 50 percent
CEC/clay ratio: 0.24 to 0.40

A or Ap horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Fine sandy loam or gravely fine sandy loam
Clay content: 2 to 15 percent
Rock fragments: 1 to 50 percent ironstone gravel
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

E horizon (where present)

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: Fine sandy loam
Clay content: 2 to 15 percent
Rock fragments: 1 to 50 percent ironstone gravel
Reaction: Very strongly acid to slightly acid (4.5 to 6.5), unless limed

Bt horizon

Hue: 2.5YR or 5YR
Value: 3 to 5
Chroma: 4 to 8
Texture: Clay loam, sandy clay, or clay
Clay content: 35 to 60 percent
Clay films: Location—on ped faces
Lithochromic mottles: Amount—none to common; size—fine and medium
Rock fragments: Gray platy shale fragments are in the lower part of some pedons
Base saturation: Less than 35 percent
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

BtC horizon

Hue: 2.5YR to 10YR
Value: 3 to 5
Chroma: 4 to 8
Texture: Fine sandy loam, sandy clay loam, clay loam, or clay
Clay content: 25 to 50 percent
Clay films: Location—on ped faces
Lithochromic mottles: Amount—none to common; size—fine and medium
Rock fragments: Amount—none to common; kind—sandstone or shale materials
Base saturation: Less than 35 percent
Reaction: Extremely acid or very strongly acid (3.6 to 5.0)

C/Bt or CBt horizon

Hue: 2.5YR to 10YR
Value: 3 to 5
Chroma: 4 to 8
Texture: Sandy clay loam in the sandstone materials, and clay loam in the shale materials. The amount of sandstone or shale materials is variable and there may be none of either in some pedons.
Clay content: Variable
Clay films: Location—on faces of peds in the Bt horizon
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Cd horizon

Hue: 2.5YR to 10YR
Value: 3 to 5
Chroma: 1 to 8
Texture: Fine sandy loam or sandy clay loam in the sandstone materials, and clay loam or clay in the shale materials. The amount of sandstone or shale materials is variable and there may be none of either in some pedons.
Clay content: Variable
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Kisatchie Series

MLRA: 133B—Western Coastal Plain
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from siltstone
Geology: Catahoula Formation, Yazoo Formation, and Whitsett Formation

Drainage class: Well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Moderately deep to paralithic bedrock
Shrink-swell potential: High
Slope: 5 to 15 percent

Associated Soils

Letney soils have sandy surfaces 20 to 40 inches thick.
Tehran soils have sandy surfaces more than 40 inches thick.

Taxonomic Classification

Fine, smectitic, thermic Typic Hapludalfs

Typical Pedon

Kisatchie loam in an area of Kisatchie loam, 5 to 15 percent slopes; in Sabine County, Sabine National Forest compartment #114, in Yellowpine, about 1.2 miles southwest on Farm Road 2343 to U.S. Forest Service Road 159, 0.5 mile northwest, and on east side of road. Hurricane Creek, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 10 minutes, 7.50 seconds N.; Longitude: 93 degrees, 44 minutes, 4.10 seconds W.

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) loam; weak medium granular structure; friable, slightly hard; common fine and common medium roots; strongly acid; clear wavy boundary.

E—3 to 5 inches; grayish brown (10YR 5/2) loam; weak medium subangular blocky structure; friable, slightly hard; common fine and common medium roots; very strongly acid; abrupt wavy boundary.

Bt1—5 to 9 inches; 80 percent grayish brown (10YR 5/2) clay; moderate medium subangular blocky structure; extremely firm, very hard; common fine roots between peds; very strongly acid; gradual wavy boundary.

Bt2—9 to 18 inches; 80 percent grayish brown (10YR 5/2) clay; 20 percent medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure and weak medium prismatic; extremely firm, extremely hard; common fine roots between peds; common slickensides; extremely acid; gradual wavy boundary.

Bt/C—18 to 26 inches; 70 percent grayish brown (10YR 5/2) and 10 percent pale brown (10YR 6/3) clay; 20 percent medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure and weak medium prismatic; extremely firm, extremely hard; common fine roots between peds; extremely acid; gradual wavy boundary.

Cy/Bt—26 to 34 inches; 50 percent light yellowish brown (2.5Y 6/4) and 50 percent light brownish gray (2.5Y 6/2), mudstone bedrock, fractured at intervals of weak medium subangular blocky structure; extremely firm, extremely hard; common fine roots between peds; 2 percent fine distinct spherical weakly cemented gypsum crystals with clear boundaries infused into matrix along faces of peds; mudstone material with common slickensides; extremely acid; gradual wavy boundary.

Cry—34 to 60 inches; light yellowish brown (2.5Y 6/4), mudstone bedrock; structureless; rigid, moderately hard; 1 percent medium distinct spherical weakly cemented gypsum crystals with clear boundaries infused into matrix along faces of peds; mudstone material; extremely acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is dry in some part for more than 90 cumulative days in most years.

Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 0 to 13 inches
Solum thickness: 20 to 40 inches over siltstone or sandstone
Clay content: 35 to 55 percent
Base saturation: 60 to 90 percent above the paralithic contact
Redoximorphic features: Iron concentrations in shades of brown and iron depletions in shades of gray begin within a depth of 24 inches.

A horizon (where present)

Hue: 10YR
Value: 2 to 4
Chroma: 1 or 2
Texture: Loam
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

E horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: Fine sandy loam or loam
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Upper Bt horizon

Hue: 7.5YR to 5Y
Value: 5 or 6
Chroma: 2 to 6
Lithochromic mottles: Amount—few or common; size—fine to medium; contrast—faint or medium; boundary—clear or diffuse; shades—brown
Texture: Silty clay or clay
Clay content: 35 and 55 percent clay in the upper 20 inches
Reaction: Extremely acid or very strongly acid (3.6 to 5.0)

Lower Bt, Bt/C or Cy/Bt horizon

Hue: 7.5YR to 5Y
Value: 5 or 6
Chroma: 2 to 6
Lithochromic mottles: Amount—few or common; size—fine to medium; contrast—faint or medium; boundary—clear or diffuse; shades—brown
Texture: Silty clay or clay
Rock fragments: 0 to 35 percent siltstone or sandstone fragments 0.5 to 1 inch thick and 0.8 to 4 inches long oriented horizontally
Clay content: 35 and 55 percent clay
Reaction: Extremely acid or very strongly acid (3.6 to 5.0)

Cry horizon

Sandstone or siltstone colors: Shades of brown or olive
Gypsum content: 5 to 25 percent gypsum accumulation

2Cr horizon (where present)

Sandstone or siltstone colors: Shades of brown or olive

Kurth Series

MLRA: 133B—Western Coastal Plain

Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Yegua Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Slow
Soil depth class: Very deep to paralithic bedrock
Shrink-swell potential: Moderate
Slope: 1 to 3 percent

Associated Soils

Koury soils have coarse-silty control sections and are on flood plains.
Moswell soils have very-fine control sections.
Penning soils have gray wetness mottles in the upper part of the subsoil.

Taxonomic Classification

Fine-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs

Typical Pedon

Kurth fine sandy loam in an area of Kurth fine sandy loam, 1 to 3 percent slopes, in intermixed conifers and hardwoods; from the intersection of Farm Road 1277 and Texas Highway 147 on the north side of Broaddus, approximately 0.53 mile northwest on Farm Road 1277, approximately 0.6 mile west and northwest on County Road 3400, 25 feet north of road and 200 feet east of property line in compartment #25 of the Angelina National Forest. Broaddus, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 19 minutes, 27.50 seconds N.; Longitude: 94 degrees, 16 minutes, 35.20 seconds W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular parting to weak fine subangular blocky structure; friable, soft; strongly acid; clear smooth boundary.

E1—8 to 18 inches; pale brown (10YR 6/3) fine sandy loam; weak fine subangular blocky structure; friable, soft; moderately acid; gradual smooth boundary.

E2—18 to 26 inches; pale brown (10YR 6/3) fine sandy loam; 1 percent fine distinct brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable, soft; moderately acid; gradual smooth boundary.

Bt/E1—26 to 34 inches; yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) fine sandy loam; 5 percent medium and coarse distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable, slightly hard; 8 percent clay bridges; 17 percent pale brown (10YR 6/3) skeletans; strongly acid; gradual smooth boundary.

Bt/E2—34 to 42 inches; yellowish brown (10YR 5/6), and brownish yellow (10YR 6/6) sandy clay loam; weak medium subangular blocky structure; firm, hard; 20 percent clay films; 10 percent light brownish gray (10YR 6/2) skeletans; 1 percent fine prominent red (2.5YR 4/6) masses of oxidized iron; strongly acid; clear smooth boundary.

2Btg—42 to 50 inches; gray (10YR 5/1) sandy clay loam; moderate medium subangular blocky structure; firm, hard; 20 percent clay films; 10 percent medium prominent weak red (10R 4/4) masses of oxidized iron; 5 percent fine and medium distinct yellowish brown (10YR 5/6) masses of oxidized iron; very strongly acid; gradual smooth boundary.

2BtgC—50 to 61 inches; gray (10YR 5/1) clay; moderate medium subangular blocky structure; firm, hard; 10 percent clay films; 20 percent medium and coarse

prominent yellowish red (5YR 4/6), and 10 percent medium distinct yellowish brown (10YR 5/6) masses of oxidized iron; 10 percent sandstone fragments; very strongly acid; clear smooth boundary.

2C—61 to 80 inches; 40 percent light yellowish brown (10YR 6/4), 40 percent pale brown (10YR 6/3), and 20 percent dark gray (7.5YR 4/1) stratified sandy clay loam; platy structure; very firm, very hard; stratified mudstone and sandstone; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 cumulative days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to albic materials: 16 to 30 inches
Depth to argillic horizon: 16 to 30 inches
Depth to glossic horizon: 16 to 60 inches
Depth to redoximorphic concentrations: 16 to 30 inches
Depth to redoximorphic depletions: 26 to 40 inches
Depth to episaturation: 30 to 40 inches
Depth to clayey 2Btg horizon: 40 to 60 inches
Solum thickness: Greater than 60 inches
Clay content: 20 to 30 percent
Silt content: 15 to 30 percent
Rock fragments: 0 to 2 percent
CEC/clay ratio: 0.24 to 0.40

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Fine sandy loam
Clay content: 3 to 10 percent
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

E horizon

Hue: 10YR
Value: 5 or 6
Chroma: 2 to 4
Texture: Fine sandy loam
Clay content: 3 to 10 percent
Reaction: Strongly acid or moderately acid (5.1 to 6.0)

Bt horizon (where present)

Hue: 2.5YR to 10YR
Value: 4 to 7
Chroma: 5 to 8
Texture: Fine sandy loam or sandy clay loam
Clay content: 18 to 35 percent
Glossic features: Albic materials (E) make up less than 10 percent
Reaction: Strongly acid or moderately acid (5.1 to 6.0)

Bt/E horizon

Hue: 2.5YR to 10YR
Value: 4 to 7
Chroma: 5 to 8

Texture: Fine sandy loam or sandy clay loam
Clay content: 18 to 35 percent
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—distinct; boundary—clear; shades—brown, yellow, and red
Redoximorphic depletions: Iron depletions or masses in the upper part appear to be relict; in the lower part some may be contemporary: Amount—none to common; size—fine to medium; contrast—distinct; boundary—diffuse to clear; shades—gray
Albic materials (E): Make up 10 to 40 percent of the horizon, but are more than 15 percent in some subhorizon that is more than 2 inches thick.
Reaction: Strongly acid or moderately acid (5.1 to 6.0)

2Btg horizon

Hue: 10YR
Value: 5 to 7
Chroma: 1 or 2
Texture: Clay loam or clay
Clay content: 30 to 45 percent
Redoximorphic concentrations: Amount—few to many; kind—masses; shades—red or brown
Redoximorphic depletions: Amount—none to few; shades—gray
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

2BtgC horizon (where present)

Hue: 10YR
Value: 5 to 7
Chroma: 1 or 2
Texture: Sandy clay loam, clay loam, or clay
Clay content: 30 to 45 percent
Redoximorphic concentrations: Amount—few to many; kind—masses; shades—red or brown
Redoximorphic depletions: Amount—none to few; shades—gray
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

2C horizon

Matrix *colors:* Mainly in shades of brown or gray, with strata, streaks, and masses with these colors or shades of red or yellow.
Texture: Fine sandy loam, sandy clay loam, clay loam, or loam and is weakly consolidated sandstone or mudstone or is stratified with these materials. In some pedons, it is also stratified with shale and/or siltstone.
EC (dS/m): 0.5 to 2.0
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

LaCerda Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Cook Mountain Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to densic material

Shrink-swell potential: High
Slope: 0 to 15 percent

Associated Soils

Etoile soils have loamy surface layers.
Naclina soils more alkaline in the upper part.

Taxonomic Classification

Very-fine, smectitic, thermic Chromic Dystruderts

Typical Pedon

LaCerda clay loam (fig. 8) in an area of LaCerda clay loam, 0 to 5 percent slopes; located in San Augustine County, east of Etoile, from the junction of Texas. Highway 103 and County Road 316, 0.6 mile east on Texas Highway 103, and site is 75 feet south of Texas Highway 103 in woods. Norwood, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 23 minutes, 37.70 seconds N.; Longitude: 94 degrees, 13 minutes, 24.40 seconds W.

Ap—0 to 3 inches; brown (10YR 4/3) crushed, clay loam; firm, slightly hard, very sticky; 1 percent fine distinct spherical moderately cemented iron-manganese concretions in matrix with clear boundaries; very strongly acid; clear wavy boundary.

Bw—3 to 10 inches; 80 percent red (2.5YR 4/6) broken face, clay; very firm, extremely hard, very sticky; 20 percent fine prominent irregular brown (10YR 5/3) clay depletions between peds with clear boundaries; very strongly acid; clear smooth boundary.

Bss1—10 to 18 inches; 80 percent red (2.5YR 4/6) broken face, clay; very firm, extremely hard, very sticky; 10 percent medium prominent irregular reddish brown (5YR 5/4) clay depletions between peds with clear boundaries; 10 percent coarse prominent irregular clay depletions between peds with clear boundaries; extremely acid; clear smooth boundary.

Bss2—18 to 29 inches; 49 percent reddish brown (5YR 5/4) broken face and 49 percent red (2.5YR 4/6) broken face, clay; very firm, extremely hard, very sticky; 2 percent fine distinct irregular light brownish gray (10YR 6/2) clay depletions between peds with clear boundaries; extremely acid; clear smooth boundary.

Bss3—29 to 43 inches; 40 percent yellowish red (5YR 5/8) broken face and 40 percent light olive brown (2.5Y 5/4) broken face, clay; very firm, extremely hard, very sticky; 10 percent fine prominent irregular red (2.5YR 4/6) clay depletions between peds with clear boundaries; moderately acid; clear smooth boundary.

Bss4—43 to 60 inches; 80 percent light olive brown (2.5Y 5/4) broken face, clay; 20 percent fine prominent irregular brownish yellow (10YR 6/8) clay depletions between peds with clear boundaries; neutral; clear smooth boundary.

C—60 to 80 inches; light olive brown (2.5Y 5/4) broken face clay, bedrock; bedrock material in the C horizon is shale.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is dry in some part for more than 60 cumulative days in most years.
Mean annual soil temperature: 67 to 70 degrees F
Solum thickness: 40 to 60 inches
Other features: When dry, cracks 0.5-inch to more than 1 inch wide extend from the surface to a depth of more than 12 inches. Cracks are open from 60 to 90 cumulative days in most years. Slickensides and wedge-shaped peds begin at a depth of 10 to 24 inches. Undisturbed areas have gilgai relief with microknolls about 4 to 12 inches above the microdepressions. Distance from the center of the

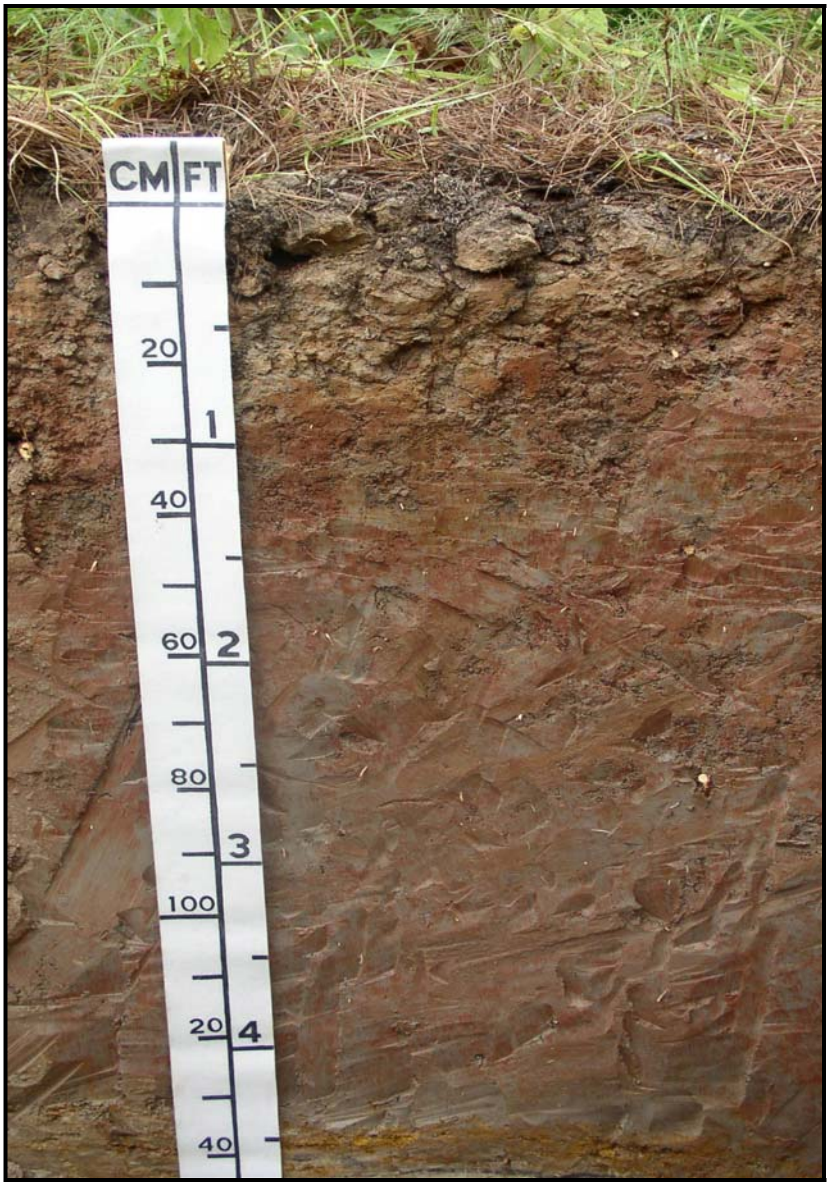


Figure 8.—Profile of LaCerda clay loam, 0 to 5 percent slopes. The LaCerda soils have clayey subsoils that developed over densic material. The densic material can be seen at a depth of 48 inches.

microknoll to the center of the microdepression ranges from 4 to about 15 feet. Mottles are considered to be lithochromic or relict.

Clay content: 60 to 72 percent

A horizon

Hue: 7.5YR or 10YR
Value: 3 or 4
Chroma: 1 to 4
Texture: Clay loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bw horizon

Hue: 2.5YR to 10YR
Value: 4 or 5
Chroma: 4 to 8
Lithochromic mottles: Amount—few to many; size—fine to medium; contrast—faint or distinct; boundary—clear or diffuse; shades—brown or gray, or horizon is variegated in these color
Texture: Silty clay or clay
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Upper Bss horizon

Hue: 2.5YR to 2.5Y
Value: 4 to 6
Chroma: 1 to 8, or is variegated in these colors
Texture: Silty clay or clay
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Lower Bss horizon

Hue: 2.5YR to 2.5Y
Value: 4 to 6
Chroma: 1 to 8, or is variegated in these colors
Texture: Silty clay or clay
Reaction: Very strongly acid to neutral (4.5 to 7.3)

C horizon

Color features: Shades of brown, yellow, or gray, or variegated layers, platy or weakly bedded
Texture: Clay
Gypsum content: None to common
Calcium carbonate content: None to common
Effervescence: Very slight to slight
Reaction: Moderately acid to moderately alkaline (5.6 to 8.4)

Laneville Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Flood plains
Position on landform: Concave or linear areas
Parent material: Loamy alluvium
Geology: Alluvium
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Slow
Soil depth class: Very deep
Shrink-swell potential: High
Slope: 0 to 1 percent

Associated Soils

Cuthbert and Maben soils have red clayey subsoils.
Dreka soils are wetter and gray.
Iulus and Owentown soils are coarse-loamy.
Rentzel and Hainesville soils have sandy surface layers.

Taxonomic Classification

Fine-silty, siliceous, active, thermic Fluvaquentic Eutrochrepts

Typical Pedon

Laneville loam in an area of Laneville loam, 0 to 1 percent slopes, frequently flooded, in tame pastureland; from the intersection of Texas Highway 7 and Loop 500 on the southwest side of Center, 0.1 mile southwest on Texas Highway 7, southeast 500 feet through gate in pastureland on flood plain of Huana Creek. Center, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 45 minutes, 56.95 seconds N.; Longitude: 94 degrees, 12 minutes, 7.39 seconds W.

Ap—0 to 7 inches; brown (10YR 4/3) loam; weak fine subangular blocky structure; friable, soft; common fine and few medium roots; few fine pores; 1 percent dark brown (10YR 3/3) manganese coatings; 1 percent strong brown (7.5YR 5/6) manganese coatings; 1 percent very dark gray (10YR 3/1) iron-manganese nodules; very strongly acid; clear smooth boundary.

Bw1—7 to 10 inches; dark yellowish brown (10YR 4/4), grayish brown (10YR 5/2), and yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable, hard; few fine and medium roots; very strongly acid; clear smooth boundary.

Bw2—10 to 24 inches; dark yellowish brown (10YR 4/4), grayish brown (10YR 5/2), and yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable, hard; few fine roots; few fine pores; 10 percent fine and medium faint dark yellowish brown (10YR 4/6) masses of oxidized iron; very strongly acid; gradual smooth boundary.

Bg—24 to 35 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; firm, hard; few fine roots; few fine and medium pores; 10 percent fine and medium faint yellowish brown (10YR 5/6) masses of oxidized iron; 3 percent very dark gray (10YR 3/1) iron-manganese nodules; 1 percent dark brown (10YR 3/3) and brown (10YR 4/3) manganese coatings; very strongly acid; gradual wavy boundary.

2Bg1—35 to 45 inches; grayish brown (10YR 5/2) clay; moderate medium subangular blocky structure; very firm, very hard; few fine roots; 5 percent medium distinct dark yellowish brown (10YR 4/6) masses of oxidized iron; 3 percent very dark gray (10YR 3/1) iron-manganese nodules; 2 percent brown (10YR 4/3) manganese coatings; very strongly acid; gradual wavy boundary.

2Bg2—45 to 80 inches; grayish brown (10YR 5/2) clay; moderate medium subangular blocky structure; extremely firm, extremely hard; few fine roots; 10 percent fine and medium distinct strong brown (7.5YR 5/6) masses of oxidized iron; 1 percent fine and medium very dark gray (10YR 3/1) iron-manganese nodules; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 69 degrees F
Depth to lithologic discontinuity: 30 to 50 inches
Depth to cambic horizon: 4 to 18 inches
Depth to redoximorphic concentrations: 4 to 50 inches
Depth to redoximorphic depletions: 4 to 24 inches
Depth to episaturation: 18 to 36 inches
Depth to horizon containing more the 35 percent clay: 30 to 50 inches
Buried A horizons: May occur at a depth of 30 to 60 inches
Solum thickness: More than 80 inches

Clay content: 25 to 34 percent
Sand content: 10 to 40 percent
Rock fragments: 0 to 5 percent
CEC/clay ratio: 0.40 to 0.60

A or Ap horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Loam
Clay content: 10 to 25 percent
Redoximorphic concentrations: Amount—none to common; size—fine and medium; contrast—faint to prominent; boundary—diffuse or clear; shades—red, brown, or yellow
Iron-manganese concentrations: Amount—0 to 5 percent; size—fine to medium; kind—masses, nodules, or concretions
Rock fragments: Amount—0 to 5 percent; kind—rounded ironstone
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 3 to 8, or horizon can be variegated in these colors
Texture: Loam, clay loam, or silty clay loam
Clay content: 18 to 34 percent
Redoximorphic concentrations: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; location—in matrix; shades—red
Redoximorphic depletions: Amount—few to many; size—fine to coarse; contrast—faint to distinct; boundary—diffuse to clear; shades—gray or olive
Iron-manganese concentrations: Amount—0 to 5 percent; size—fine to medium; kind—masses, nodules, or concretions
Rock fragments: Amount—0 to 5 percent; kind—rounded ironstone
Base saturation: 60 percent or more in a subhorizon between 10 to 30 inches from the surface.
EC (dS/m): 0 to 2
Sodium adsorption ratio: 0 to 2
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Bg horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: Loam, clay loam, or silty clay loam
Clay content: 18 to 34 percent
Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—red, brown, or yellow
Iron-manganese concentrations: Amount—0 to 5 percent; size—fine or medium; kind—masses, nodules, or concretions
Rock fragments: Amount—0 to 5 percent; kind—rounded ironstone
EC (dS/m): 0 to 2
Sodium adsorption ratio: 0 to 2
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

2Bg horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: Clay loam or clay
Clay content: 35 to 50 percent
Redoximorphic concentrations: Amount—common to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—red, brown, or yellow
Iron-manganese concentrations: Amount—0 to 5 percent; size—fine or medium; kind—masses, nodules, or concretions
Rock fragments: Amount—0 to 5 percent; kind—rounded ironstone
EC (dS/m): 0 to 4
Sodium adsorption ratio: 0 to 4
Reaction: Extremely acid to moderately acid (3.6 to 6.0). Some pedons are slightly acid to neutral below a depth of 60 inches.

2BC horizon (where present below 60 inches)

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: Silt loam, loam, silty clay loam, or clay loam
Clay content: 15 to 34 percent
Redoximorphic concentrations: Amount—common to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—red, brown, or yellow
Iron-manganese concentrations: Amount—0 to 5 percent; size—fine or medium; kind—nodules or concretions
Rock fragments: Amount—0 to 5 percent; kind—rounded ironstone
EC (dS/m): 0 to 4
Sodium adsorption ratio: 0 to 4
Reaction: Extremely acid to neutral (3.6 to 7.3)

Latex Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces, marine terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Geology: Wilcox Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Slow
Soil depth class: Very deep
Shrink-swell potential: High
Slope: 1 to 3 percent

Associated Soils

Bernaldo soils do not have a clayey lower subsoil.
Dreka and Laneville soils are on flood plains.

Eastwood and Meth soils have red, clayey subsoils.
Guyton soils are wetter and gray throughout.
Metcalf soils are somewhat poorly drained.
Sawtown soils have thicker surfaces layers.

Taxonomic Classification

Fine-loamy, siliceous, semiactive, thermic Glossic Paleudalfs

Typical Pedon

Latex fine sandy loam in an area of Latex fine sandy loam, 1 to 3 percent slopes, in intermixed conifers and hardwoods; from the intersection of Farm Road 2694 and Farm Road 3172 at Huxley, approximately 0.4 mile east on Farm Road 2694, 0.2 mile south then southeast on oil topped road (Whooping Crane Road), and 200 feet south of road in compartment #21 of the Sabine National Forest. Union Springs, Louisiana USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 44 minutes, 54.25 seconds N.; Longitude: 93 degrees, 51 minutes, 41.86 seconds W.

A—0 to 7 inches; brown (10YR 4/3) fine sandy loam; weak very fine subangular blocky structure; friable, soft; common fine to coarse roots; moderately acid; clear smooth boundary.

E—7 to 11 inches; brown (7.5YR 5/4) very fine sandy loam; weak fine subangular blocky structure; friable, soft; common fine to coarse roots; moderately acid; gradual smooth boundary.

Bt1—11 to 22 inches; strong brown (7.5YR 5/8) loam; weak medium subangular blocky structure; friable, soft; common fine and medium roots; 10 percent clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—22 to 30 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm, slightly hard; common fine and medium roots; 10 percent clay films on faces of peds; 2 percent ironstone nodules; very strongly acid; gradual smooth boundary.

Bt3—30 to 40 inches; reddish yellow (7.5YR 6/8) loam; moderate medium subangular blocky structure; firm, slightly hard; common medium roots; 10 percent clay films on faces of peds; 10 percent medium distinct yellowish red (5YR 5/8) masses of oxidized iron; 10 percent medium prominent red (2.5YR 4/8) masses of oxidized iron; 10 percent medium distinct brownish yellow (10YR 6/6) iron depletions; 3 percent ironstone nodules; very strongly acid; gradual smooth boundary.

Bt/E—40 to 55 inches; brownish yellow (10YR 6/6) loam; moderate medium subangular blocky structure; firm, slightly hard; common medium roots; 10 percent clay films on faces of peds; 10 percent medium and coarse prominent red (2.5YR 4/8) masses of oxidized iron; 10 percent pale brown (10YR 6/3) clay depletions; very strongly acid; gradual smooth boundary.

2Bt/E—55 to 58 inches; red (2.5YR 4/8) clay loam; moderate medium subangular blocky structure; firm, hard; common medium roots; 5 percent clay films on faces of peds; 8 percent medium and coarse distinct dark red (10R 3/6) masses of oxidized iron; 10 percent light brownish gray (10YR 6/2) clay depletions; 8 percent medium prominent light brownish gray (10YR 6/2), and 8 percent medium prominent brownish yellow (10YR 6/6) iron depletions; very strongly acid; clear smooth boundary.

2Bt—58 to 80 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; firm, hard; common fine roots; 10 percent clay films on faces of peds; 1 percent fine distinct brownish yellow (10YR 6/6) masses of oxidized iron; 5 percent light brownish gray (10YR 6/2) redoximorphic depletions; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 2 to 22 inches
Solum thickness: More than 80 inches
Combined thickness of A and E horizons: 6 to 18 inches
Clay content: 18 to 35 percent
Rock fragments: Rounded quartzite or ironstone pebbles range from none to few
CEC/clay ratio: 0.24 to 0.40
Base saturation: 35 to 60 percent at a depth of 50 inches (below the top of the argillic horizon)
Redoximorphic features: Iron concentrations in shades of brown and iron depletions in shades of gray begin within a depth of 24 inches.
Other distinctive soil features: Depth to the clayey discontinuity ranges from 36 to 60 inches. Petrified wood fragments less than 3 inches across range from none to few near the contact of the 2Bt horizon.

A horizon

Hue: 10YR
Value: 4 or 5
Chroma: 2 to 4
Texture: Fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 3 or 4
Texture: Fine sandy loam or very fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

Bt horizon

Hue: 2.5YR to 10YR
Value: 5 or 6
Chroma: 6 or 8
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear to diffuse; shades—red, brown, or yellow
Texture: Loam, clay loam, or sandy clay loam
Albic material (E): Amount—0 to 4 percent; kind—streaks and pockets
Rock fragments: Amount—0 to 15 percent by volume; kind—ironstone pebbles; however some pedons have pockets 6 to 10 inches in diameter that contain up to 35 percent pebbles.
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Bt/E horizon

Hue: Bt part—2.5YR to 10YR
Value: Bt part—5 or 6
Chroma: Bt part—6 or 8
Color features: Some horizons have a variegated matrix of these colors
Albic materials (E): Amount—5 to 10 percent by volume; kind—streaks and pockets
Brittle masses of iron accumulation: In some pedons, amount—up to 25 percent by volume; shades—dark red, red, or yellowish red

Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear to diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: Amount—0 to 15 percent by volume; kind—ironstone pebbles
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

2Bt/E horizon

Hue: Bt part—10R to 10YR
Value: Bt part—3 to 5
Chroma: Bt part—6 or 8
Color features: Some pedons have a variegated matrix with these colors
Albic materials (E): Amount—5 to 15 percent by volume; kind—streaks and pockets
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear to diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray
Texture: Clay loam or clay
Clay content: 35 to 45 percent clay
Rock fragments: Amount—0 to 10 percent by volume; kind—ironstone pebbles
Reaction: Very strongly acid or strongly acid (4.5 to 5.0)

2Bt horizon (where present)

Hue: 10R to 10YR
Value: 3 to 5
Chroma: 6 or 8
Color features: Some pedons have a variegated matrix with these colors
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear to diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to distinct; boundary—clear to diffuse; shades—gray
Texture: Clay loam, clay, or silty clay
Clay content: 35 to 45 percent clay
Rock fragments: Amount—0 to 10 percent by volume; kind—ironstone pebbles
Reaction: Very strongly acid or strongly acid (4.5 to 5.0)

Letney Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear or linear areas
Parent material: Sandy and loamy marine deposits
Geology: Whitsett Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately rapid
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 1 to 15 percent

Associated Soils

Rayburn soils do not have sandy surfaces more than 20 inches.

Taxonomic Classification

Loamy, siliceous, semiactive, thermic Arenic Paleudults

Typical Pedon

Letney loamy sand in an area of Letney loamy sand, 1 to 5 percent slopes; from Farm Road 355 in Groveton, 6.6 miles east on U.S. Highway 287, 2.7 miles south on County Road ,1.5 miles northeast on woods road, and 50 feet north in woods. Colita, Texas USGS 7.5-minute topographic quadrangle; Latitude: 30 degrees, 59 minutes, 42.00 seconds N.; Longitude: 95 degrees, 1 minute, 7.00 seconds W.

Ap—0 to 3 inches; brown (10YR 4/3) loamy sand; single grain; very friable, loose; many fine and medium roots; moderately acid; clear smooth boundary.

E—3 to 24 inches; pale brown (10YR 6/3) loamy sand; single grain; very friable, loose; many fine and medium roots; moderately acid; clear wavy boundary.

Bt1—24 to 29 inches; brownish yellow (10YR 6/6) sandy clay loam; 1 percent fine distinct reddish yellow (7.5YR 6/8) mottles; weak fine subangular blocky structure; friable, slightly hard; common fine and medium roots; strongly acid; gradual wavy boundary.

Bt2—29 to 33 inches; brownish yellow (10YR 6/6) sandy clay loam; 5 percent fine prominent yellowish red (5YR 5/8) and 5 percent fine and medium prominent dark red (2.5YR 3/6) mottles; moderate medium subangular blocky structure; firm, hard; common fine and medium roots; strongly acid; gradual wavy boundary.

Bt3—33 to 43 inches; brownish yellow (10YR 6/6) sandy clay loam; 10 percent coarse prominent dark red (2.5YR 3/6) and 5 percent fine faint yellow (10YR 7/8) mottles; moderate medium subangular blocky structure; firm, hard; common fine roots; strongly acid; gradual wavy boundary.

Bt4—43 to 80 inches; red (2.5YR 5/8) sandy clay loam; 10 percent medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; firm, hard; common fine roots; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 14 to 42 inches
Solum thickness: 60 to more than 80 inches
Thickness of sandy epipedon: 20 to 40 inches
Clay content: 18 to 32 percent in the upper 20 inches of the argillic horizon
Silt content: 5 to 10 percent in the upper 20 inches of the argillic horizon
Coarse and very coarse sand: 10 to 25 percent of the sand fraction
CEC/clay ratio: 0.24 to 0.40
Base saturation: 15 to 30 percent in the lower part of the argillic horizon

A horizon

Hue: 10YR
Value: 3 to 5, where values are less than 3.5, thickness is less than 7 inches
Chroma: 2 or 3
Texture: Loamy sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E horizon

Hue: 10YR
Value: 5 to 7
Chroma: 3 or 4
Texture: Loamy sand
Rock fragments: Amount—none to 10 percent; kind—siliceous; size—gravel
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Upper Bt

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 4 or 6
Mottles: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray; location—greater than 60 inches below the surface
Texture: Sandy loam or sand clay loam
Rock fragments: Amount—none to 10 percent; kind—siliceous gravel
Plinthite: Amount—none to 5 percent by volume
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Lower Bt horizon and BC horizon (where present)

Hue: 2.5YR to 10YR
Value: 3 to 6
Chroma: 6 or 8
Mottles: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red
Texture: Sandy loam or sandy clay loam
Other features: Some pedons have many small white and purple shale fragments and masses of clay
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Lilbert Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 1 to 5 percent

Associated Soils

Darco soils have sandy surfaces more than 40 inches thick.
Iulus soils have coarse-loamy control sections and are on flood plains.
Kirvin soils have fine control sections and sola 40 to 60 inches thick to densic material.

Rentzel soils have gray mottles in the upper part.
Tenaha soils have sola 40 to 60 inches thick.

Taxonomic Classification

Loamy, siliceous, semiactive, thermic Arenic Plinthic Paleudults

Typical Pedon

Lilbert loamy fine sand in an area of Lilbert loamy fine sand, 1 to 5 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 147 and Farm Road 1279 (north of San Augustine), 1.5 miles west on Farm Road 1279, 1.2 miles north on County Road 111, and 50 feet east in woods. San Augustine East, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 36 minutes, 8.00 seconds N.; Longitude: 94 degrees, 5 minutes, 55.60 seconds W.

Ap—0 to 3 inches; grayish brown (10YR 5/2) loamy fine sand, brown (10YR 5/3), dry; single grain; loose, loose; slightly acid; clear smooth boundary.

E1—3 to 12 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak fine subangular blocky structure; very friable, soft; moderately acid; gradual smooth boundary.

E2—12 to 36 inches; light yellowish brown (10YR 6/4) loamy fine sand; 5 percent medium faint pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; very friable, soft; moderately acid; gradual smooth boundary.

Bt—36 to 45 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly hard; clay films; 5 percent medium and coarse prominent yellowish red (5YR 4/6), and 1 percent fine distinct strong brown (7.5YR 5/6) masses of oxidized iron; strongly acid; gradual smooth boundary.

Btv1—45 to 56 inches; light yellowish brown (10YR 6/4) sandy clay loam; weak medium subangular blocky structure; friable, slightly hard; clay films; 15 percent medium prominent red (2.5YR 4/6) masses of oxidized iron; 10 percent coarse prominent red (2.5YR 4/8) masses of oxidized iron; 5 percent medium and coarse faint yellowish brown (10YR 5/6) masses of oxidized iron; 6 percent plinthite nodules; strongly acid; gradual smooth boundary.

Btv2—56 to 62 inches; pale brown (10YR 6/3) and light brownish gray (10YR 6/2) and light yellowish brown (10YR 6/4) sandy clay loam; weak medium subangular blocky structure; friable, slightly hard; clay films; 5 percent medium and coarse prominent red (2.5YR 4/8) masses of oxidized iron; 8 percent plinthite nodules; very strongly acid; clear smooth boundary.

BtC—62 to 80 inches; red (10R 4/8) sandy clay loam; weak medium subangular blocky structure; firm, hard; clay films; 5 percent medium and coarse prominent light brownish gray (10YR 6/2) iron depletions; 3 percent fine and medium prominent yellowish brown (10YR 5/6) masses of oxidized iron; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is dry in some or all parts for 75 to 90 days in normal years.
Mean annual soil temperature: 66 to 71 degrees F
Depth to densic materials: 60 to more than 80 inches
Depth to albic materials: 3 to 10 inches
Depth to albic horizon: 3 to 10 inches
Depth to argillic horizon: 20 to 40 inches
Depth to horizon: 30 to 60 inches; 5 to 15 percent plinthite
Depth to lithochromic mottles: 20 to 40 inches
Thickness of the sandy epipedon: 20 to 40 inches

Solum thickness: 60 to more than 80 inches
Clay content: 20 to 30 percent
Rock fragments: 0 to 5 percent
CEC/clay ratio: 0.24 to 0.40

A or Ap horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Loamy fine sand
Clay content: 3 to 15 percent
Rock fragments: Amount—0 to 10 percent; kind—ironstone
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

E horizon

Hue: 10YR
Value: 5 to 7
Chroma: 3 or 4
Texture: Loamy fine sand
Clay content: 3 to 15 percent
Rock fragments: Amount—0 to 10 percent; kind—ironstone
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

Bt horizon

Hue: 5YR to 10YR
Value: 5 or 6
Chroma: 6 or 8
Texture: Fine sandy loam or sandy clay loam
Clay content: 20 to 34 percent
Clay films: Location—faces of peds and in pores; contrast—faint to prominent
Lithochromic mottles: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in matrix; shades—red, brown, or gray
Plinthite: Amount—0 to 4 percent; kind—nodular
Rock fragments: Amount—0 to 5 percent; kind—ironstone
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Btv horizon

Hue: 2.5YR to 10YR
Value: 4 to 7
Chroma: 1 to 8
Color features: This horizon is often variegated with these colors
Texture: Fine sandy loam or sandy clay loam
Clay content: 16 to 34 percent
Clay films: Location—faces of peds and in pores; contrast—faint to prominent
Lithochromic mottles: Amount—none to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in matrix; shades—red, brown, or gray
Plinthite: Amount—5 to 15 percent; kind—nodular
Glossic features: 0 to 4 percent
Rock fragments: Amount—0 to 5 percent; kind—ironstone
Brittleness: 0 to 15 percent
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Btv/E horizon (where present)

Hue: 10R to 10YR
Value: 4 to 7
Chroma: 1 to 8
Color features: This horizon is often variegated with these colors
Texture: Fine sandy loam or sandy clay loam
Clay content: 16 to 34 percent
Clay films: Location—faces of peds and in pores; contrast—faint to prominent
Lithochromic mottles: Amount—none to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in matrix; shades—red, brown, or gray
Plinthite: Amount—5 to 15 percent; kind—nodular
Glossic features: 5 to 10 percent
Rock fragments: Amount—0 to 5 percent; kind—ironstone
Brittleness: 0 to 15 percent
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

B't or BtC horizon (where present)

Hue: 10R to 10YR
Value: 4 to 7
Chroma: 1 to 8
Color features: This horizon is often variegated with these colors
Texture: Fine sandy loam or sandy clay loam
Clay content: 16 to 34 percent
Clay films: Location—faces of peds and in pores; contrast—faint to prominent
Lithochromic mottles: Amount—none to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse to clear; location—in matrix; shades—red, brown or gray
Plinthite: Amount—0 to 4 percent; kind—nodular
Glossic features: 0 to 5 percent
Rock fragments: Amount—0 to 5 percent; kind—ironstone
Brittleness: 0 to 15 percent
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Lovelady Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Yegua Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 1 to 8 percent

Associated Soils

Rayburn soils do not have sandy surfaces more than 20 inches thick.

Taxonomic Classification

Loamy, mixed, semiactive, thermic Arenic Glossudalfs

Typical Pedon

Lovelady loamy fine sand in an area of Lovelady loamy fine sand, 1 to 5 percent slopes, in intermixed conifers and hardwoods; in Pennington, 7.1 miles east on Farm Road 358, 3.6 miles northwest on U.S. Forest Service Road 502, 0.3 mile east on road in timber to U.S. Forest Service boundary, and 200 feet north of road in woods. Pennington, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 14 minutes, 52.00 seconds N.; Longitude: 95 degrees, 7 minutes, 37.00 seconds W.

A—0 to 6 inches; brown (10YR 5/3) loamy fine sand; weak medium granular structure; loose, loose; common fine and common medium roots; moderately acid; clear smooth boundary.

E1—6 to 23 inches; pale brown (10YR 6/3) loamy fine sand; single grain; loose, loose; common fine and common medium roots; moderately acid; clear wavy boundary.

E2—23 to 32 inches; light yellowish brown (10YR 6/4) loamy fine sand; single grain; loose, loose; common fine and common medium roots; moderately acid; clear wavy boundary.

Bt/E1—32 to 51 inches; 75 percent yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable, hard; common fine roots; 30 percent clay films; 25 percent pale brown (10YR 6/3) skeletans; 10 percent medium distinct red (2.5YR 4/8) masses of oxidized iron; strongly acid; gradual wavy boundary.

Bt/E2—51 to 55 inches; 30 percent dark red (2.5YR 3/6), 30 percent grayish brown (10YR 5/2), and 15 percent brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; friable, hard; common fine roots; 30 percent clay films; 25 percent pale brown (10YR 6/3) skeletans; strongly acid; gradual wavy boundary.

2Bt—55 to 80 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; friable, hard; few fine roots; 10 percent clay films; 2 percent pale brown (10YR 6/3) skeletans; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 4 to 29 inches
Solum thickness: 60 to 80 inches
Thickness of sandy epipedon: 40 to 60 inches
Rock fragments: Rounded quartzite pebbles and smooth fragments of petrified wood, typically less than 3 inches across the long axis, range from few to about 5 percent in the A, E, and Bt/E horizons of most pedons. These fragments also form a discontinuous stone line at the contact of the 2Bt horizon.
Depth to lithologic discontinuity: 40 to 60 inches
Clay content: 20 to 35 percent
CEC/clay ratio: 0.24 to 0.40

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Loamy fine sand

Clay content: 2 to 8 percent
Silt content: 7 to 21 percent
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed.

E horizon

Hue: 10YR
Value: 5 to 7
Chroma: 3 or 4
Redoximorphic concentrations: Amount—none to common; size—fine or medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Texture: Loamy sand or loamy fine sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Upper Bt/E horizon

Hue: Bt part—5YR to 10YR
Value: Bt part—5 or 6
Chroma: Bt part—4 to 8
Redoximorphic concentrations: Amount—few to many; size—fine or medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—none to common; size—fine or medium; contrast—faint or distinct; boundary—clear or diffuse; shades—gray; location—in lower part
Texture: Fine sandy loam or sandy clay loam
Albic materials (E): 5 to 30 percent of the horizon; however, some subhorizons 4 inches or more thick is present that contains 15 or more percent albic material that makes up the E horizon
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Lower Upper Bt/E horizon

Bt part

Hue: 2.5 YR to 10YR
Value: 3 to 6
Chroma: 4 to 8
Redoximorphic concentrations: Amount—few to many; size—fine or medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—none to common; size—fine or medium; contrast—faint or distinct; boundary—clear or diffuse; shades—gray; location—in lower part
Texture: Fine sandy loam or sandy clay loam

E part

Hue: 10YR
Value: 5
Chroma: 2
Albic materials (E): 5 to 30 percent of the horizon; however, some subhorizons 4 inches or more thick is present that contains 15 or more percent albic material that makes up the E horizon
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

2Bt or 2Bt/E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 1 or 2

Redoximorphic concentrations: Amount—few to many; size—fine or medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow. Some pedons have a variegated matrix of these colors.
Albic materials (E): 2 to 10 percent in the upper portion of horizon
Texture: Fine sandy loam, sandy clay loam, clay loam, or sandy clay
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Maben Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Wilcox Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Moderately deep to densic material
Shrink-swell potential: High
Slope: 5 to 35 percent

Associated Soils

A soil similar to Maben with a loamy subsoil.
A soil that developed less than 20 inches deep.
Attoyac and Austonio soils have less clayey subsoils.
Eastwood and Meth soils are more than 40 inches to densic material.
Laneville and Dreka soils are on flood plains.
Metcalf soils are somewhat poorly drained.
Tenaha soils have sandy surfaces 20 to 40 inches thick.

Taxonomic Classification

Fine, mixed, active, thermic Ultic Hapludalfs

Typical Pedon

Maben fine sandy loam in an area of Maben fine sandy loam, 5 to 15 percent slopes, in conifers; from the intersection of Texas Highway 87 and Farm Road 353 in the southeast corner of Shelby County, approximately 1.2 miles southwest on Farm Road 353 to intersection with County Road 2907, 0.66 mile south on County Road 2907, and site is in road cut on east side of County Road. Patroon South, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 34 minutes, 44.70 seconds N.; Longitude: 93 degrees, 59 minutes, 2.50 seconds W.

A—0 to 4 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure; friable, soft; many fine to coarse roots; strongly acid; clear smooth boundary.

Bt1—4 to 14 inches; yellowish red (5YR 4/6) clay loam; 10 percent medium faint reddish brown (5YR 4/4) mottles; moderate medium subangular blocky structure; firm, hard; many fine and medium, and common coarse roots; 10 percent clay films on faces of peds; 2 percent noncalcareous sandstone fragments; very strongly acid; gradual smooth boundary.

Bt2—14 to 24 inches; yellowish red (5YR 4/6) clay loam; 10 percent fine and medium distinct red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm, hard; common fine and medium roots; 10 percent clay films on

faces of peds; 10 percent light brownish gray (10YR 6/2) shale fragments; very strongly acid; gradual smooth boundary.

Bt/C—24 to 28 inches; reddish brown (5YR 5/4) (Bt) and yellowish brown (10YR 5/4) (C) silty clay loam; 1 percent medium faint reddish brown (5YR 4/4) mottles; weak fine subangular blocky structure; friable, slightly hard; common fine and medium roots; 5 percent clay films on faces of peds; common strata of light brownish gray (10YR 6/2) shale; few yellowish red (5YR 4/6) strata; very strongly acid; gradual smooth boundary.

C—28 to 38 inches; yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), light yellowish brown (10YR 6/4), and strong brown (7.5YR 4/6) silt loam; weak platy structure parting to massive; firm, slightly hard; common medium roots in cracks; very strongly acid; gradual smooth boundary.

Cd—38 to 80 inches; light brownish gray (10YR 6/2) and light reddish brown (2.5YR 6/4) weathered bedrock; platy structure; very firm, very hard; common strata 6 inches thick of siltstone; shale strata 2 inches thick; few 0.25 inch ironstone strata; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 4 to 7 inches
Solum thickness: 20 to 48 inches
Rock fragments: Amount—none to common; kind—ironstone or sandstone; location—throughout
CEC/clay ratio: 0.40 to 0.60

A or Ap horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 3 or 4
Texture: Fine sandy loam
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bt horizon

Hue: 2.5YR or 5YR
Value: 3 to 5
Chroma: 4 to 8
Mottles: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Texture: Clay loam, silty clay, or clay
Clay content: 35 to 55 percent in the upper 20 inches of the Bt horizon
Rock fragments: Amount—none to many; kind—soft shale or laminar clay, generally increasing with depth
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

B/C or Bt/C horizon

Hue: B part—2.5YR or 5YR; C part—2.5YR to 10YR
Value: B part—3 to 5; C part—4 to 6
Chroma: B part—4 to 8; C part—5 to 8
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Texture: B part—clay loam, silty clay, or clay; C part—shale and laminar clay
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

C or Cd horizon

Hue: 2.5YR to 10YR
Value: 4 to 6
Chroma: 4 to 8
Color features: Shades of gray; or variegated in shades of red, brown, yellow, and gray
Texture: Soft shale or laminar clay; stratified sandy clayey sediments. Individual strata range from fine sand to clay, with thickness of individual strata range from 0.1 inch to several inches.
Rock fragments: Thin lenses of ironstone occur in many pedons
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Mattex Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Flood plains
Position on landform: Concave or linear areas
Parent material: Loamy alluvium
Geology: Holocene sediments
Drainage class: Somewhat poorly drained
Saturated hydraulic conductivity class: Slow
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 0 to 1 percent

Associated Soils

Iulus soils are brown and have coarse-loamy control sections.

Taxonomic Classification

Fine-loamy, siliceous, active, acid, thermic Aeric Fluvaquents

Typical Pedon

Mattex loam in an area of Mattex-Iulus complex, 0 to 1 percent slopes, frequently flooded, in hardwoods; from the intersection of Texas Highway 147 and U.S. Highway 96 on the south side of San Augustine, approximately 5.3 miles south on Texas Highway 147 to intersection with County Road 330 (Union Grove Church), approximately 0.5 mile west on County Road 330 to right angle turn in County Road, south on log road 1,200 feet to slough in flood plain, and 100 feet southwest in timber. Norwood, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 26 minutes, 16.70 seconds N.; Longitude: 94 degrees, 9 minutes, 33.00 seconds W.

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) loam; weak fine subangular blocky structure; friable, soft; few fine, common medium, and few coarse roots; strongly acid; gradual smooth boundary.

Bg1—3 to 15 inches; gray (10YR 5/1) loam; weak medium subangular blocky structure; friable, soft; few fine and few medium roots; 5 percent fine and medium prominent brown (7.5YR 4/4) masses of oxidized iron with diffuse boundaries; 5 percent coarse prominent brown (7.5YR 4/4) masses of oxidized iron with diffuse boundaries; very strongly acid; gradual smooth boundary.

Bg2—15 to 25 inches; grayish brown (10YR 5/2) loam; weak medium subangular blocky structure; friable, soft; few medium roots; 10 percent fine distinct brown (7.5YR 5/4), and 8 percent fine and medium prominent reddish brown (5YR

5/4) masses of oxidized iron with diffuse boundaries; very strongly acid; gradual smooth boundary.

Bg3—25 to 37 inches; gray (10YR 5/1) sandy clay loam; weak medium subangular blocky structure; firm, slightly hard; 1 percent fine prominent reddish brown (5YR 5/4) and strong brown (7.5YR 5/8) masses of oxidized iron with diffuse boundaries; very strongly acid; gradual smooth boundary.

2Bgb1—37 to 54 inches; gray (10YR 6/1) clay loam; massive; firm, hard; 8 percent fine and medium prominent brown (7.5YR 4/4), and 8 percent fine and medium distinct brownish yellow (10YR 6/6) masses of oxidized iron with diffuse boundaries; very strongly acid; gradual smooth boundary.

2Bgb2—54 to 69 inches; gray (10YR 6/1) clay loam; massive; firm, hard; 10 percent medium distinct yellowish brown (10YR 5/6), and 5 percent fine and medium prominent brown (7.5YR 5/4) masses of oxidized iron with diffuse boundaries; very strongly acid; gradual smooth boundary.

2Bgb3—69 to 80 inches; gray (10YR 6/1) clay loam; massive; firm, hard; 13 percent fine and medium prominent brown (7.5YR 5/4), 13 percent medium distinct yellowish brown (10YR 5/6), and 12 percent coarse distinct yellowish brown (10YR 5/6) masses of oxidized iron with diffuse boundaries; very strongly acid.

Range in Characteristics

Soil moisture: An aquic soil moisture regime.
Mean annual soil temperature: 67 to 70 degrees F
Solum thickness: More than 80 inches
Other features: Depth to a horizon with more than 35 percent clay ranges from 35 to 50 inches
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)
Clay content: 20 to 34 percent
CEC/clay ratio: 0.40 to 0.60
Redoximorphic features: None to common iron-manganese concretions

A horizon

Hue: 10YR
Value: 3 or 5
Chroma: 1 or 3
Texture: Loam, sandy clay loam, or clay loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bw horizon (where present)

Hue: 10YR
Value: 4 to 6
Chroma: 3 to 6
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Loam, sandy clay loam, or clay loam
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Bg horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2

Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown or yellow
Redoximorphic concentrations: Amount—none to few; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red
Texture: Fine sandy loam, very fine sandy loam, loam, sandy clay loam, or clay loam
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

2Bgb horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Clay loam or clay
Clay content: 35 to 50 percent; below a depth of 60 inches, 20 to 35 percent
Reaction: Very strongly acid to moderately acid (4.5 to 6.0). Some pedons are slightly acid or neutral (6.1 to 7.3) below a depth of 60 inches

Metcalf Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces; marine terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Geology: Wilcox Formation
Drainage class: Somewhat poorly drained
Saturated hydraulic conductivity class: Very slow to impermeable
Soil depth class: Very deep
Shrink-swell potential: High
Slope: 0 to 2 percent

Associated Soils

An unnamed soil that does not have a clayey lower subsoil.
Dreka and Laneville soils are on flood plains.
Eastwood, Maben, and Meth soils have red clayey subsoils.
Gallime soils have thicker surfaces and do not have clayey subsoils
Latex soils are moderately well drained.
Mollville and Guyton soils are wetter and gray throughout.

Taxonomic Classification

Fine-silty, siliceous, semiactive, thermic Aquic Glossudalfs

Typical Pedon

Metcalf very fine sandy loam in an area of Metcalf-Sawtown complex, 0 to 2 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 84 and Farm Road 947 in Tenaha, 2.3 miles northwest on Farm Road 947, and site is north of road 100 feet in wooded area. Tenaha West, Texas USGS 7.5-

minute topographic quadrangle; Latitude: 31 degrees, 57 minutes, 38.09 seconds N.; Longitude: 94 degrees, 16 minutes, 8.43 seconds W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak fine subangular blocky structure parting to weak medium granular; very friable, soft; common fine and medium roots; very strongly acid; gradual smooth boundary.

E/Bt—7 to 11 inches; 60 percent pale brown (10YR 6/3) (E) and 40 percent brownish yellow (10YR 6/6) (Bt) loam; weak medium subangular blocky structure; friable, slightly hard; common fine and medium roots; common fine and medium pores; 2 percent clay films on faces of peds; 1 percent fine faint yellowish brown (10YR 5/6) masses of oxidized iron lining pores; extremely acid; gradual smooth boundary.

Bt/E1—11 to 17 inches; brownish yellow (10YR 6/6) loam; moderate medium subangular blocky structure; firm, hard; common medium roots; common fine and medium pores; 30 percent by volume streaks and pockets of albic material (E); 6 percent discontinuous clay films on faces of peds; 1 percent fine distinct strong brown (7.5YR 5/6) masses of oxidized iron; 30 percent pale brown (10YR 6/3) clay depletions; 1 percent fine distinct light brownish gray (10YR 6/2) iron depletions; very strongly acid; clear wavy boundary.

Bt/E2—17 to 35 inches; pale brown (10YR 6/3) loam; moderate medium subangular blocky structure; firm, very hard; common medium roots; 20 percent by volume streaks and pockets of albic material (E); 6 percent discontinuous clay films on faces of peds; 30 percent medium and coarse prominent red (2.5YR 4/6) masses of oxidized iron; 20 percent very pale brown (10YR 7/3) clay depletions; 10 percent fine and medium prominent light brownish gray (10YR 6/2) iron depletions; strongly acid; clear wavy boundary.

2Bt—35 to 80 inches; yellowish brown (10YR 5/6), gray (10YR 6/1), and red (2.5YR 4/6) clay; moderate medium subangular blocky structure; extremely firm, extremely hard; common medium roots; 6 percent discontinuous clay films on faces of peds; 6 percent slickensides (pedogenic); 6 percent pressure faces; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 3 to 17 inches
Solum thickness: 60 to more than 100 inches
Depth to clayey discontinuity (2Bt horizon): 27 to 40 inches
Reaction: Very strongly acid to moderately acid (3.6 to 6.0), unless limed
CEC/clay ratio: 0.24 to 0.40

A or Ap horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Very fine sandy loam
Reaction: Extremely acid to moderately acid (3.6 to 6.0), unless limed

E horizon (where present)

Hue: 10YR
Value: 5 or 6
Chroma: 3 or 4
Texture: Very fine sandy loam, loam, or silt loam
Reaction: Extremely acid to moderately acid (3.6 to 6.0), unless limed

E/Bt horizon (where present)

Hue: E part—10YR; Bt part—10YR
Value: E part—5 or 6; Bt part—5 or 6
Chroma: E part—3 or 4; Bt part—4 to 8
Texture: E part—silt loam or loam; Bt part—clay loam
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Bt horizon (where present)

Hue: 10YR
Value: 5 or 6
Chroma: 4 to 8
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray with chroma of 1 or 2; location—in the lower part of the horizon
Texture: Loam, silt loam, or clay loam
Other features: Some pedons do not have a Bt horizon above the Bt/E horizon
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Bt/E horizon

Hue: Bt part—10YR
Value: Bt part—5 or 6
Chroma: Bt part—2 to 6, or variegated in these shades
E part: Shades of gray
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray with chroma of 1 or 2
Clay depletions: Few to common clay depletions with chroma of 1 or 2.
Texture: Bt part—silt loam, loam, or clay loam; E part—uncoated silt loam or very fine sandy loam
Albic materials (E): More than 15 percent intrusions in all or some subhorizon of the Bt/E horizon
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

2Btg or 2Bt horizon

Color features: Variegated in shades of gray, red, and brown
Texture: Silty clay, clay, or clay loam
Clay content: More than 35 percent clay
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Meth Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Ridges
Geomorphic positions, three-dimensional: Crest
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Wilcox Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 1 to 5 percent

Associated Soils

Eastwood soils have high shrink-swell clays in the subsoil.
Latex soils have brown or yellow loamy subsoils.
Lilbert and Tenaha soils have sandy surfaces 20 to 40 inches thick.
Maben soils are 20 to 40 inches deep to densic material.
Metcalf soils are somewhat poorly drained.
Sawtown soils are loamier with thicker surfaces.

Taxonomic Classification

Fine, mixed, semiactive, thermic Ultic Hapludalfs

Typical Pedon

Meth fine sandy loam (fig. 9) in an area of Meth fine sandy loam, 1 to 5 percent slopes, in conifers; from the intersection of Farm Road 2694 and Farm Road 3172 at Huxley, approximately 0.9 mile south on Farm Road 3172, 200 feet west of road on logging road on narrow ridgetop, and 10 feet south of road in compartment #21 of the Sabine National Forest. Logansport West, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 44 minutes, 53.27 seconds N.; Longitude: 93 degrees, 51 minutes, 56.54 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many very fine to coarse roots; moderately acid; clear wavy boundary.

E—4 to 8 inches; brown (7.5YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable; many very fine to coarse roots; common very fine and fine vesicular pores; 2 percent fine prominent yellowish red (5YR 4/6) masses of oxidized iron; moderately acid; clear wavy boundary.

Bt1—8 to 21 inches; red (2.5YR 4/6) clay; 1 percent fine prominent yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm, hard; common coarse and many very fine to medium roots; common very fine and fine vesicular pores; 50 percent continuous prominent red (2.5YR 4/6) clay films; 1 percent discontinuous distinct (10YR 2/1) iron stains on vertical faces of peds; 1 percent distinct black (10YR 2/1) manganese coatings on vertical faces of peds; strongly acid; diffuse wavy boundary.

Bt2—21 to 30 inches; red (2.5YR 4/8) clay; 5 percent fine and medium prominent yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm, hard; common coarse and many very fine to medium roots; common very fine and fine vesicular pores; 50 percent continuous prominent red (2.5YR 4/6) clay films; 1 percent discontinuous distinct black (10YR 2/1) iron stains on vertical faces of peds; 1 percent distinct black (10YR 2/1) manganese coatings on vertical faces of peds; strongly acid; gradual wavy boundary.

Bt3—30 to 43 inches; red (2.5YR 5/8) sandy clay loam; 5 percent fine and medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak fine and medium subangular blocky; hard; common fine and medium roots; common very fine and fine vesicular pores; 30 percent discontinuous prominent red (2.5YR 4/6) clay films; 1 percent discontinuous distinct black (10YR 2/1) iron stains on vertical faces of peds; 1 percent distinct black (10YR 2/1) manganese coatings on vertical faces of peds; 1 percent irregular mica flakes throughout; few fine prominent light gray (10YR 7/1) shale fragments; very strongly acid; gradual wavy boundary.

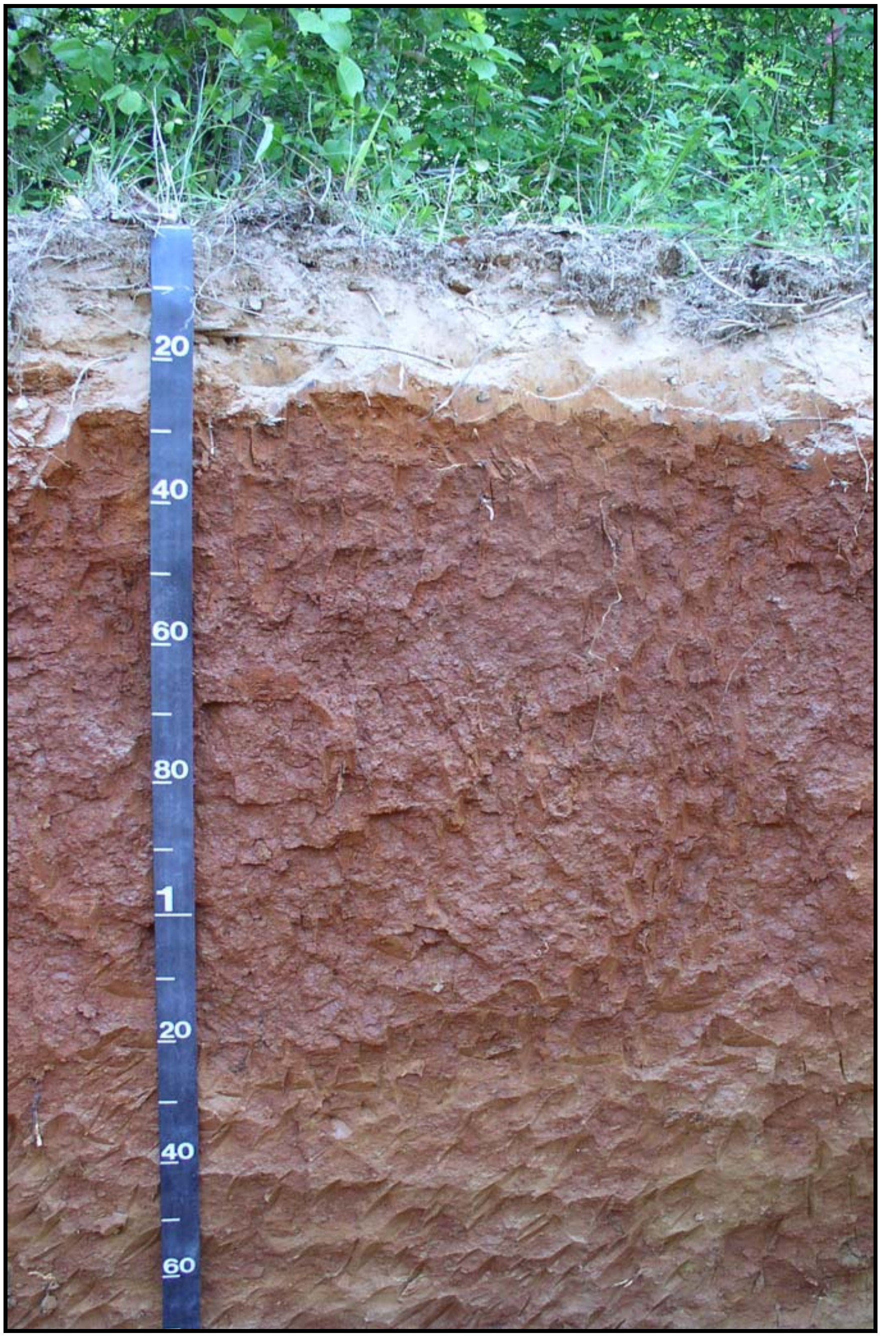


Figure 9.—Profile of Meth fine sandy loam, 1 to 5 percent slopes. Meth soils have a fine sandy loam surface layer over clayey subsoil. The red colors are because of the presence of iron.

BCt1—43 to 54 inches; red (2.5YR 5/8) sandy clay loam; 5 percent fine and medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak fine and medium subangular blocky; firm, hard; common fine and medium roots; common very fine and fine vesicular pores; 8 percent patchy distinct red (2.5YR 4/6) clay films; 1 percent discontinuous distinct (10YR 2/1) iron stains on vertical faces of peds; 1 percent distinct black (10YR 2/1) manganese coatings on vertical faces of

peds; 1 percent irregular mica flakes throughout; common fine and medium prominent light gray (10YR 7/1) shale fragments; very strongly acid; clear wavy boundary.

BCt2—54 to 69 inches; red (2.5YR 5/8) sandy clay loam; 8 percent fine and medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak fine and medium subangular block; firm, hard; common fine roots; common very fine and fine vesicular pores; 5 percent patchy distinct red (2.5YR 4/6) clay films; 2 percent discontinuous distinct black (10YR 2/1) iron stains on vertical faces of peds; 1 percent distinct black (10YR 2/1) manganese coatings on vertical faces of peds; 1 percent irregular mica flakes throughout; common fine and medium prominent light gray (10YR 7/1) shale fragments; very strongly acid; clear wavy boundary.

BC—69 to 80 inches; yellowish red (5YR 4/6) fine sandy loam; 10 percent fine and medium prominent light gray (10YR 7/2) mottles; weak medium angular blocky structure; friable, slightly hard; common fine roots; common very fine and fine vesicular pores; 1 percent irregular mica flakes; 10 percent 2.0- to 5.9-inch shale fragments; common medium and coarse prominent light gray (10YR 7/1) shale fragments; 0.1 to 0.5-inch thick ironstone strata at the upper part of the horizon; fractures 2 to 3 inches wide filled with roots and clean sand pockets; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 3 to 20 inches
Solum thickness: 60 to 80 inches
Clay content: 18 to 35 percent
CEC/clay ratio: 0.24 to 0.40

A or Ap horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Fine sandy loam
Rock fragments: Amount—0 to 20 percent by volume; kind—ironstone
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

E horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: Fine sandy loam
Rock fragments: Amount—0 to 20 percent by volume; kind—ironstone
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

Bt horizon

Hue: 2.5YR to 10YR
Value: 3 to 6
Chroma: 4 to 8
Lithochromic mottles: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown or yellow

Texture: Clay loam, sandy clay, or clay in upper part of horizon. The lower part is sandy loam, fine sandy loam, or sandy clay loam, with ped coatings and streaks or pockets of yellow or gray sand or fine sandy loam.
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

BC or BCt horizon

Hue: 2.5YR to 10YR
Value: 4 to 6
Chroma: 4 to 8, or horizon is variegated in red, yellow, or gray
Texture: Sandy loam, fine sandy loam, or sandy clay loam with streaks or pockets of less clayey material
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

C or Cd horizon (where present at a depth of 60 inches)

Color features: Shades of brown or gray
Lithochromic mottles and/or strata: Shades of brown or gray with or without yellow
Texture: Fine sandy loam to silty clay loam
Other features: Material is unconsolidated to weakly consolidated and slakes in water
Reaction: Extremely acid to neutral (3.6 to 7.3) and highly variable

Mollville Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Depressions on stream terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium
Geology: Fluviatile terraces
Drainage class: Poorly drained
Saturated hydraulic conductivity class: Slow
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 0 to 1 percent

Associated Soils

Bernaldo soils are well drained.
Besner soils have coarse-loamy control sections and are better drained.
Gallime soils have fine-loamy control sections and are better drained.
Guyton soils have silty subsoils.
Laneville, Dreka, and Iulus soils are on flood plains.
Metcalf soils are somewhat poorly drained.
Sawtown soils are better drained.

Taxonomic Classification

Fine-loamy, siliceous, active, thermic Typic Glossaqualfs

Typical Pedon

Mollville loam in an area of Mollville-Besner complex, 0 to 1 percent slopes, mounded, in hardwoods; from the intersection of Farm Road 139 and Farm Road 2427 southeast of Shelbyville, approximately 2.2 miles northwest on County Road 2545 to intersection with U.S. Forest Service Road 112, 2.1 miles east on U.S. Forest Service Road 112 to highline right-of-way, 1,600 feet northeast on right-of-way, and 200 feet west of right-of-way in low area between mounds in compartment #27 of the

Sabine National Forest. Patroon North, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 43 minutes, 22.00 seconds N.; Longitude: 93 degrees, 56 minutes, 17.00 seconds W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; friable, soft; common fine and medium roots; 1 percent medium prominent dark yellowish brown (10YR 3/4) masses of oxidized iron throughout with diffuse boundaries; 1 percent coarse prominent very dark grayish brown (10YR 3/2) iron depletions with diffuse boundaries; very strongly acid; clear wavy boundary.

Eg—5 to 9 inches; gray (10YR 5/1) loam; weak medium subangular blocky structure; friable, slightly hard; many fine roots; very strongly acid; clear irregular boundary.

Btg/E1—9 to 17 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; firm, slightly hard; common fine to coarse roots; 6 percent clay films on faces of peds; 20 percent light brownish gray (10YR 6/2) clay depletions (E) with diffuse boundaries; 10 percent fine and medium distinct dark yellowish brown (10YR 4/4) masses of oxidized iron lining pores with diffuse boundaries; very strongly acid; gradual wavy boundary.

Btg/E2—17 to 35 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; firm, slightly hard; common medium roots; 7 percent clay films on faces of peds; 30 percent light brownish gray (10YR 6/2) clay depletions (E) with diffuse boundaries; 1 percent medium distinct yellowish brown (10YR 5/6) masses of oxidized iron lining pores with diffuse boundaries; moderately acid; gradual wavy boundary.

Btg/E3—35 to 57 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; firm, slightly hard; common medium roots; 9 percent clay films on faces of peds; 30 percent light brownish gray (10YR 6/2) clay depletions (E) with diffuse boundaries; 10 percent medium and coarse distinct strong brown (7.5YR 5/6) masses of oxidized iron in matrix with diffuse boundaries; moderately acid; gradual wavy boundary.

BCtg/E—57 to 76 inches; grayish brown (10YR 5/2) loam; weak medium subangular blocky structure parting to massive; friable, soft; common fine roots; 3 percent clay films; 35 percent light brownish gray (10YR 6/2) clay depletions (E) with diffuse boundaries; 10 percent medium and coarse distinct strong brown (7.5YR 5/6) masses of oxidized iron in matrix with diffuse boundaries; slightly alkaline; clear wavy boundary.

2Cg—76 to 80 inches; grayish brown (10YR 5/2) fine sandy loam; massive; loose, loose; common medium roots; 10 percent fine and medium faint light yellowish brown (10YR 6/4), and 1 percent fine distinct strong brown (7.5YR 5/6) masses of oxidized iron throughout with diffuse boundaries; slightly alkaline.

Range in Characteristics

Soil moisture: An aquic soil moisture regime. The soil is dry in the moisture control section for 50 cumulative days or more in most years.

Mean annual soil temperature: 67 to 70 degrees F

Depth to argillic horizon: 6 to 22 inches

Solum thickness: 40 to more than 80 inches, typically, when the solum is less than 60 inches thick the soil is underlain by a sandy 2C horizon.

Thickness of ochric epipedon: 6 to 20 inches

Clay content: 20 to 35 percent

Sand content: About 20 to 40 percent of the sand fraction is coarser than very fine sand.

CEC/clay ratio: 0.40 to 0.60

Salinity: Nonsaline to slightly saline
Sodium adsorption ratio: 2 to 10, throughout the argillic horizon

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 or 2
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

Eg horizon

Hue: 10YR
Value: 4 to 8
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown or yellow
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

Btg/E horizon

Hue: Bt part—10YR or 2.5Y; E part—10YR
Value: Bt part—5 to 7; E part—5 to 8
Chroma: Bt part—1 or 2; E part—1 or 2
Other features: The faces of some peds have darker coats than these colors.
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Texture: Loam, sandy clay loam, or clay loam
Albic material (E): Amount—5 to 35 percent of the horizon; kind—vertical intrusions, streaks, or pockets. Some subhorizon at least 2 inches in thickness has more than 15 percent intrusions of albic materials.
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

BCtg/E horizon

Hue: BCtg part—10YR or 2.5Y; E part—10YR
Value: BCtg part—5 to 7; E part—5 to 8
Chroma: BCtg part—1 or 2; E part—1 or 2
Other features: The faces of some peds have darker coats than these colors.
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Texture: Loam, sandy clay loam, or clay loam
Albic material (E): Amount—5 to 35 percent of the horizon; kind—vertical intrusions, streaks, or pockets
Reaction: Very strongly acid to slightly alkaline (4.5 to 7.3)

2C or Cg horizon

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 to 4
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow or it is variegated with these colors
Texture: Loamy fine sand or fine sandy loam, or it is stratified with these textures
Clay content: 3 to 12 percent
Reaction: Strongly acid to slightly alkaline (5.1 to 7.8)

Moswell Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Caddell Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to densic material
Shrink-swell potential: High
Slope: 1 to 15 percent

Associated Soils

Kurth soils have fine-loamy control sections.
Naclina soils have carbonate concretions throughout.

Taxonomic Classification

Very-fine, smectitic, thermic Vertic Hapludalfs

Typical Pedon

Moswell loam in an area of Moswell loam, 1 to 5 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 21 and U.S. Highway 96 in San Augustine, 23 miles south on U.S. Highway 96 to the intersection with Texas Highway 83 in Pineland, 2.6 miles west on Texas Highway 83, 1.4 miles south on County Road DV, 0.35 mile southeast on Rhames Road, 0.4 mile south on woods road, and 50 feet east in clear cut area. Buck Bay, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 13 minutes, 18.20 seconds N.; Longitude: 94 degrees, 1 minutes, 37.00 seconds W.

Ap—0 to 2 inches; very dark grayish brown (10YR 3/2) loam; weak medium subangular blocky structure; friable, slightly hard; many fine, many medium, and few coarse roots; moderately acid; clear wavy boundary.

A—2 to 5 inches; brown (10YR 4/3) loam; weak medium subangular blocky structure; friable, slightly hard; many fine, many medium, and few coarse roots; moderately acid; clear wavy boundary.

Bt—5 to 13 inches; yellowish red (5YR 4/6) clay; 8 percent fine prominent gray (10YR 6/1) and 8 percent medium prominent gray (10YR 6/1) mottles; weak fine subangular blocky structure; very firm, very hard; common fine and

common medium roots; 45 percent clay films; very strongly acid; gradual wavy boundary.

Btss—13 to 36 inches; light brownish gray (10YR 6/2) clay; 8 percent fine and medium prominent red (2.5YR 4/6), and 8 percent coarse prominent red (2.5YR 4/6) mottles; massive; extremely firm, extremely hard; few fine roots; 30 percent clay films; 40 percent slickensides (pedogenic); very strongly acid; clear wavy boundary.

BC—36 to 43 inches; yellowish brown (10YR 5/6) clay; 1 percent medium distinct greenish gray (10BG 6/1) mottles; weak medium subangular blocky structure; very firm, very hard; few fine roots; 1 percent fine prominent strong brown (7.5YR 5/8) manganese coatings; very strongly acid; clear wavy boundary.

C—43 to 58 inches; light yellowish brown (2.5Y 6/3) and brown (10YR 5/3) stratified silty clay loam; massive parting to platy structure; very firm, very hard; few fine roots; 1 percent medium distinct greenish gray (5GY 5/1) masses of reduced iron; C horizon is soft mudstone; extremely acid; clear wavy boundary.

Cr—58 to 80 inches; brown (7.5YR 5/3) and light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/8) stratified silty clay loam; platy structure; very firm, extremely hard; Cr horizon is layered mudstone; extremely acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 6 to 12 inches
Solum thickness: 40 to 60 inches
Thickness of ochric epipedon: 4 to 12 inches
Clay content: 60 to 65 percent
Salinity: Very slight to moderate from the mid-parts of the subsoil into the C horizon
Other features: Depth to slickensides ranges from 10 to 20 inches. When dry, the subsoil has cracks 0.5-inch wide that extend to a depth of more than 12 inches. The cracks are open for less than 90 cumulative days in most years. The redoximorphic features are mainly relict or lithochromic. This soil does not have aquic soil conditions in most years.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E horizon (where present)

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 3 or 4
Lithochromic or relict mottles: Amount—none to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown
Texture: Fine sandy loam, very fine sandy loam, or loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bt horizon

Hue: 2.5YR or 5YR
Value: 4 or 5
Chroma: 6 or 8

Lithochromic or relict mottles: Amount—none to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown, yellow, or gray
Texture: Clay
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Btss or Btssy horizon

Hue: 5YR to 2.5Y
Value: 3 to 7
Chroma: 1 to 3
Color features: Variegated in shades of red, brown, yellow, and gray
Texture: Clay
Gypsum: Amount—common to many; kind—crystals or masses; location—in some pedons. Gypsum makes up 5 to 15 percent in the lower subhorizons of some pedons.
Barite masses: Amount—few to common; location—in some pedons
Sodium adsorption ratio: 4 to 12
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

BC horizon (where present)

Hue: 2.5YR or 5YR
Value: 4 or 5
Chroma: 6 or 8
Lithochromic or relict mottles: Amount—none to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown, yellow, or gray
Texture: Clay
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Cy, C, or Cr horizon

Shale or mudstone colors: Variable, but are mainly in shades of brown, yellow, gray, or olive
Texture: Clay or silty clay loam
Other features: Masses of gypsum, barite, jarosite, and natrojarosite are in some pedons
Sodium adsorption ratio: 4 to 16, in most pedons
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Naclina Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Cook Mountain Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to densic material
Shrink-swell potential: High
Slope: 1 to 15 percent

Associated Soils

Eastwood soils do not have carbonate concretions.

Etoile soils have loamy surface layers.
LaCerda soils are more acid in the upper part.

Taxonomic Classification

Fine, smectitic, thermic Chromic Hapluderts

Typical Pedon

Naclina clay loam (fig. 10) in an area of Naclina clay loam, 1 to 5 percent slopes; in San Augustine County, from the junction of Farm Road 705 and Texas Highway 703, 1.1 miles east on Texas Highway 103, 0.55 mile south on County Road (passing just beyond the clearing with houses on east side of road), 0.25 mile east on narrow woods lane, and 50 feet north of lane in over-grown clearing. Norwood, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 23 minutes, 17.40 seconds N.; Longitude: 94 degrees, 8 minutes, 17.10 seconds W.

Ap—0 to 6 inches; 80 percent dark yellowish brown (10YR 4/4) clay loam; 10 percent fine distinct light yellowish brown (2.5Y 6/3), 5 percent medium prominent yellowish red (5YR 4/6), and 4 percent medium distinct strong brown (7.5YR 4/6) mottles; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; many fine roots; many medium moderate continuity tubular pores; 1 percent nonflat subrounded indurated ironstone nodules; neutral; abrupt wavy boundary.

Bw—6 to 21 inches; 68 percent brownish yellow (10YR 6/6) clay; 25 percent medium distinct red (2.5Y 4/6), 5 percent medium prominent dark red (10R 3/6), and 2 percent fine distinct pale brown (10YR 6/3) mottles; moderate medium angular blocky structure; very firm, very hard, very sticky, very plastic; common fine roots; many fine moderate continuity tubular pores; 5 percent distinct pressure faces on faces of peds; 2 percent nonflat subrounded indurated ironstone nodules; moderately acid; clear wavy boundary.

Bss—21 to 32 inches; 88 percent light olive brown (2.5Y 5/4) clay; 5 percent medium distinct grayish brown (2.5Y 5/2), 5 percent fine distinct brownish yellow (10YR 6/8), and 2 percent fine prominent yellowish red (5YR 4/6) mottles; moderate medium angular blocky structure; very firm, very hard, very sticky, very plastic; common medium roots; common fine moderate continuity tubular pores; 20 percent distinct slickensides (pedogenic) on vertical faces of peds; 5 percent distinct pressure faces on faces of peds; 3 percent nonflat subrounded indurated ironstone nodules; slightly alkaline; gradual wavy boundary.

Bkss—32 to 56 inches; 90 percent light olive brown (2.5Y 5/4) clay; 5 percent medium distinct yellowish brown (10YR 5/8), 5 percent medium faint light olive brown (2.5Y 5/3) mottles; moderate medium angular blocky structure; extremely firm, extremely hard, very sticky, very plastic; common medium roots between peds; common fine low continuity tubular pores; 30 percent distinct slickensides (pedogenic) on faces of peds; 10 percent medium prominent irregular indurated cemented carbonate concretions with sharp boundaries in matrix; 3 percent medium prominent irregular very weakly cemented carbonate masses with sharp boundaries in matrix; 1 percent nonflat subrounded moderately iron-manganese concretions; strongly effervescent; strongly alkaline; gradual wavy boundary.

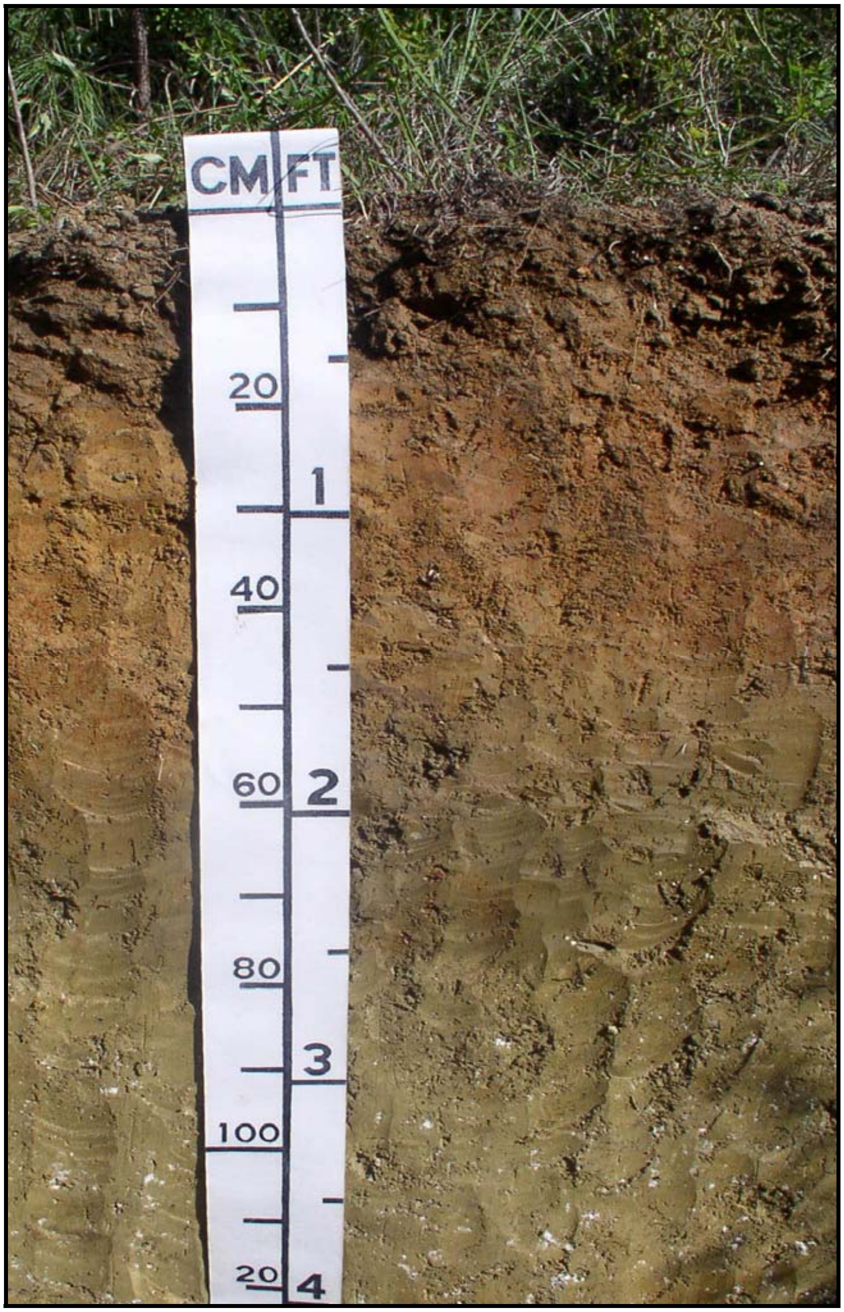


Figure 10.—Profile of Naclina clay loam, 1 to 5 percent slopes. Naclina soils are clayey throughout and are a member of the Vertisol order. These soils have high shrink-swell potentials. The white specks at a depth of 30 inches are masses of calcium carbonate.

CB—56 to 70 inches; 65 percent light yellowish brown (2.5Y 6/4) clay; 5 percent medium distinct pale olive (5Y 6/3), and 5 percent medium distinct olive yellow (2.5Y 6/8) mottles; moderate medium angular blocky structure; extremely firm, extremely hard, very sticky, very plastic; common fine roots between peds; common very fine, low continuity tubular pores; 15 percent distinct light olive gray (5Y 6/2) slickensides (pedogenic) on faces of peds; 7 percent medium prominent irregular very weakly cemented carbonate masses with sharp

boundaries in matrix and 5 percent medium prominent irregular strongly cemented carbonate concretions with sharp boundaries in matrix; violently effervescent; strongly alkaline; clear wavy boundary.

Cd—70 to 80 inches; 58 percent brownish yellow (10YR 6/6) clay; 25 percent coarse prominent gray (5Y 6/1), 10 percent medium distinct brown (7.5YR 5/4), 5 percent coarse distinct gray (5Y 5/1), and 2 percent medium prominent olive (5Y 4/4) mottles; moderate medium angular blocky structure; extremely firm, extremely hard, very sticky, very plastic; common fine roots between peds; common fine low continuity tubular pores; 30 percent distinct slickensides (pedogenic) on faces of peds; 15 percent fine prominent spherical very weakly cemented brown (7.5YR 5/4) glauconite pellets with diffuse boundaries infused into matrix along faces of peds; violently effervescent; strongly alkaline.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.

Mean annual soil temperature: 67 to 70 degrees F

Solum thickness: 40 to 60 inches

Clay content: 40 to 60 percent in the upper 20 inches of the argillic horizon

Other features: When dry, cracks 0.5-inch to more than 1 inch wide extend from the surface to a depth of more than 12 inches. Cracks remain open from 60 to 90 cumulative days in most years. Slickensides and wedge-shaped peds begin at a depth of 10 to 24 inches. Undisturbed areas have gilgai microrelief with microknolls about 4 to 12 inches above the microdepressions. Distance from the center of the microknoll to the center of the microdepression ranges from 4 to about 15 feet.

Lithochromic or relict mottles: Colors with chroma of 2 or less in the subsoil are considered to be lithochromic. Mottles with chroma of 3 or more, are considered to be relict or lithochromic.

A or Ap horizon

Hue: 5YR to 10YR

Value: 3 to 5

Chroma: 2 to 4, horizons with value 3.5 or less are less than 12 inches thick

Texture: Clay loam or clay

Reaction: Moderately acid to neutral (5.6 to 7.3)

Bw horizon

Hue: 2.5YR to 10YR

Value: 4 to 6

Chroma: 3 to 8

Lithochromic or relict mottles: Amount—none to common: size—fine to medium: contrast—faint to prominent: boundary—clear or diffuse: shades—red, brown, or gray

Texture: Silty clay or clay

Reaction: Strongly acid to neutral (5.1 to 7.3)

Bss and Bkss horizons

Hue: 7.5YR to 5Y

Value: 4 to 6

Chroma: 3 to 8

Lithochromic or relict mottles: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown,

yellow, or olive and colors with chroma of 2 or less, some subhorizons are variegated in these colors.
Texture: Silty clay or clay
Reaction: Strongly acid to moderately alkaline (5.1 to 8.4) in the upper part of the Bss horizon, slightly acid to slightly alkaline (6.1 to 7.8) in the lower part. The reaction ranges from neutral to strongly alkaline (6.6 to 9.0) in the Bkss horizon.

CB horizon

Color features: Shale or marl in shades of brown, yellow, gray, and olive
Texture: Clay
Other features: Material is in variegated layers, platy, or weakly bedded
Effervesence: Very slight to violent in most pedons
Reaction: Slightly alkaline to strongly alkaline (7.4 to 9.0)

C or Cd horizon

Color features: Shale or marl in shades of brown, yellow, gray, and olive
Texture: Clay
Other features: Material is in variegated layers, platy, or weakly bedded
Effervesence: Very slight to violent in most pedons
Reaction: Slightly alkaline to strongly alkaline (7.4 to 9.0)

Nacogdoches Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Clayey residuum weathered from glauconitic sandstone
Geology: Weches Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 1 to 5 percent

Associated Soils

Alto soils have yellow subsoils.
Chireno soils have carbonates.
Hannahatchee soils have fine-loamy control sections.
Trawick soils have sola 20 to 40 inches thick.

Taxonomic Classification

Fine, kaolinitic, thermic Rhodic Paleudalfs

Typical Pedon

Nacogdoches clay loam in an area of Nacogdoches clay loam, 1 to 5 percent slopes, in hayland; from the intersection of Texas Highway 21 and U.S. Highway 96 in San Augustine, approximately 2.65 miles west on Texas Highway 21 to intersection with County Road 217, approximately 0.3 mile north on County Road 217, in roadcut on east side of road. San Augustine West, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 32 minutes, 17.64 seconds N.; Longitude: 94 degrees, 10 minutes, 14.34 seconds W.

Ap—0 to 6 inches; dark reddish brown (2.5YR 3/4) clay loam; moderate medium subangular blocky structure; firm, hard; many fine, many medium, and few coarse roots; 5 percent ironstone nodules; moderately acid; gradual smooth boundary.

Bt1—6 to 12 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm, hard; many fine, many medium, and few coarse roots; 60 percent clay films; 5 percent ironstone nodules; strongly acid; gradual smooth boundary.

Bt2—12 to 35 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; firm, hard; common fine and common coarse roots; 60 percent clay films; 5 percent ironstone nodules; strongly acid; gradual smooth boundary.

Bt3—35 to 60 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; firm, hard; few fine and common medium roots; 50 percent clay films; 2 percent ironstone nodules; strongly acid; gradual smooth boundary.

BtC—60 to 80 inches; dark red (10R 3/6) clay; 10 percent medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure parting to platy; firm, hard; 30 percent clay films; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 4 to 10 inches
Solum thickness: 60 to more than 100 inches
Base saturation: 60 percent at 72 inches below the soil surface

A horizon

Hue: 10R or 2.5YR
Value: 2 or 3
Chroma: 2 to 6, where chromas are 3 or less, the horizon is less than 6 inches
Texture: Fine sandy loam or clay loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

Upper Bt horizon (within the upper 40 inches of horizon)

Hue: 10R or 2.5YR
Value: 3
Chroma: 6
Texture: Clay
Clay content: 40 to 60 percent dominated by tabular halloysite
Sand content: More than 25 percent
Rock fragments: Amount—2 to 15 percent by volume; kind—ironstone; size—pebbles
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

Lower Bt horizon (below 40 inches from top of the horizon)

Hue: 10R or 2.5YR
Value: 3 or 4
Chroma: 6 or 8
Texture: Clay or clay loam
Clay content: 35 to 60 percent dominated by tabular halloysite
Sand content: More than 25 percent
Rock fragments: Amount—2 to 15 percent by volume; kind—ironstone; size—pebbles
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

BtC horizon

Hue: 10R or 2.5YR
Value: 3 or 4
Chroma: 6 or 8
Texture: Clay or clay loam
Rock fragments: Amount—2 to 15 percent by volume; kind—ironstone; size—pebbles
Reaction: Very strongly acid or strongly acid (4.5 to 5.5)

C horizon (where present)

Lithology: Weathered glauconitic sandstone and greensand materials. Some pedons contain marine shells.
Reaction: Strongly acid to slightly alkaline (5.1 to 7.8)

Owentown Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Flood plains
Position on landform: Linear or concave areas
Parent material: Loamy alluvium
Geology: Holocene sediments
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 1 percent

Associated Soils

Mattex soils are gray throughout.

Taxonomic Classification

Coarse-loamy, siliceous, active, thermic Fluventic Dystrochrepts

Typical Pedon

Owentown fine sandy loam in an area of Owentown fine sandy loam, occasionally flooded, in hardwoods; from the intersection of Texas Highway 184 and U.S. Highway 96 in Bronson, approximately 3.75 miles east on Texas Highway 184, approximately 0.57 mile south on logging road to McKain Creek flood plain, and 100 feet west of road on north side of channel. Pineland North, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 21 minutes, 26.90 seconds N.; Longitude: 93 degrees, 56 minutes, 39.50 seconds W.

Ap—0 to 3 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; friable, soft; common fine and common medium roots; moderately acid; gradual smooth boundary.

Bw1—3 to 22 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable, soft; common fine and common medium roots; 1 percent fine faint light yellowish brown (10YR 6/4) masses of oxidized iron; strongly acid; gradual smooth boundary.

Bw2—22 to 34 inches; yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable, soft; common fine and common medium roots; strongly acid; gradual smooth boundary.

Bw3—34 to 50 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable, soft; few medium roots; 5 percent fine distinct light brownish gray (10YR 6/2) masses of reduced iron; 5 percent medium distinct light brownish gray (10YR 6/2) masses of reduced iron; 1 percent fine prominent yellowish red (5YR 5/6) masses of oxidized iron; strongly acid; gradual smooth boundary.

Bg—50 to 80 inches; light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable, soft; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Solum thickness: More than 80 inches
Thickness of epipedon: 20 to 40 inches
Organic carbon: Exceeds 0.2 percent at a depth of 50 inches or there is an irregular decrease of organic carbon in the particle-size control section
Reaction: Strongly acid or moderately acid (5.1 to 6.0), unless limed
Clay content: 8 to 17 percent
CEC/clay ratio: 0.40 to 0.60
Base saturation: 35 to 65 percent throughout the upper 30 inches of the solum

A or Ap horizon

Hue: 5YR to 10YR
Value: 3 to 5
Chroma: 2 to 4, when the moist color value is 3, horizon is less than 7 inches thick
Texture: Fine sandy loam

Bw horizon

Hue: 7.5YR or 10YR
Value: 3 to 6
Chroma: 3 to 8
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray, from 24 to 48 inches below the surface
Texture: Fine sandy loam or loam
Other features: Strata or pockets of loamy fine sand or sandy clay loam 0.3 to 1.2 inches thick make up less than 15 percent by volume

Ab horizon (where present at a depth of 20 to 40 inches)

Hue: 5YR to 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Loamy fine sand, fine sandy loam, or loam

Bg horizon (where present at a depth of 40 inches)

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2

Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown or yellow
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Fine sandy loam, loam, or loamy fine sand with or without strata of these textures or sandy clay loam

BC or BCg horizon (where present)

Color features: Shades of brown and gray
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or yellow
Texture: Loamy fine sand, fine sandy loam, or loam with or without strata of these textures or sandy clay loam

Penning Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Yegua Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to a bedrock densic layer
Shrink-swell potential: High
Slope: 0 to 2 percent

Associated Soils

Kelty soils have coarse-loamy control sections.
Moswell soils have very-fine control sections.

Taxonomic Classification

Fine-loamy, siliceous, active, thermic Aquic Glossudalfs

Typical Pedon

Penning loam in an area of Penning-Kurth complex, 0 to 2 percent slopes, in intermixed conifers and hardwoods; from the intersection of Farm Road 83 and Farm Road 2390 east of Broaddus, 2.3 miles south on Farm Road 2390 to intersection with U.S. Forest Service Road 304, 0.55 mile east on U.S. Forest Service Road 304, and 400 feet south of road in compartment #34 of the Angelina National Forest. Veach, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 14 minutes, 52.40 seconds N.; Longitude: 94 degrees, 13 minutes, 8.60 seconds W.

Ap—0 to 4 inches; brown (10YR 4/3) loam; weak fine subangular blocky structure; friable, soft; common fine, common medium, and few coarse roots; very strongly acid; clear smooth boundary.
E—4 to 14 inches; pale brown (10YR 6/3) loam; weak fine subangular blocky structure; friable, soft; common fine and common medium roots; 1 percent fine faint brownish yellow (10YR 6/6) masses of oxidized iron; very strongly acid; clear smooth boundary.
Bt/E1—14 to 34 inches; brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; firm, slightly hard; common fine and

common medium roots; 10 percent clay films; 10 percent light gray (10YR 7/2) skeletans; 10 percent medium distinct light brownish gray (10YR 6/2) iron depletions; very strongly acid; gradual smooth boundary.

Bt/E2—34 to 48 inches; grayish brown (10YR 5/2) sandy clay loam; moderate medium subangular blocky structure; firm, slightly hard; few fine and few medium roots; 10 percent clay films; 18 percent very pale brown (10YR 7/3) skeletans; 10 percent medium distinct strong brown (7.5YR 5/8) masses of oxidized iron; very strongly acid; gradual smooth boundary.

BC/E—48 to 56 inches; grayish brown (10YR 5/2) sandy clay loam; moderate medium subangular blocky structure; firm, hard; few medium roots; 5 percent very pale brown (10YR 7/3) skeletans; 10 percent shale fragments and 10 percent sandstone fragments; very strongly acid; clear smooth boundary.

2C—56 to 80 inches; pale yellow (2.5Y 7/4) stratified clay loam; 10 percent medium distinct strong brown (7.5YR 5/8) mottles; massive; very firm, very hard; C horizon is shale and sandstone; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 13 to 40 inches
Solum thickness: 40 to 60 inches
Clay content: 18 to 25 percent
Silt content: 30 to 45 percent
CEC/clay ratio: 0.40 to 0.60

A horizon

Hue: 10YR
Value: 3 or 4
Chroma: 1 to 3
Texture: Loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E horizon

Hue: 10YR
Value: 5 or 6
Chroma: 2 to 4
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown or yellow
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Very fine sandy loam or loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bt/E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 2 to 8
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow

Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray. In some pedons the lower part has a mixed matrix of these colors
Texture: Very fine sandy loam, loam, or sandy clay loam
Albic materials (E): 5 to about 25 percent; however, some parts of this horizon that is 4 inches or more in thickness contains 15 percent or more albic materials.
EC (dS/m): 0 to 4.0, typically increasing with depth
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

BC or BC/E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 2 to 8
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray. In some pedons the lower part has a mixed matrix of these colors
Texture: Very fine sandy loam, loam, or sandy clay loam
EC (dS/m): 0 to 4.0, typically increasing with depth
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

2C or 2Cd horizon

Color features: Shades of brown or gray
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Lithology: Mudstone, or stratified layers of these materials with strata of siltstone and sandstone in some pedons
Texture: Clay, but some pedons are clay loam
EC (dS/m): 2.0 to 8.0
Reaction: Very strongly acid to neutral (4.5 to 7.3)

Pophers Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Flood plains
Position on landform: Concave or linear areas
Parent material: Loamy alluvium
Geology: Holocene sediments
Drainage class: Somewhat poorly drained
Saturated hydraulic conductivity class: Slow
Soil depth class: Very deep
Shrink-swell potential: Moderate
Slope: 0 to 1 percent

Associated Soils

Koury soils are brown and have coarse-silty control sections

Taxonomic Classification

Fine-silty, siliceous, active, acid, thermic Aeric Fluvaquents

Typical Pedon

Pophers silt loam in an area of Pophers silt loam, 0 to 1 percent slopes, frequently flooded, in hardwoods; from the intersection of Texas Highway 83 and Farm Road 1175 in Hemphill, 5.0 miles southeast on Texas Highway 83 to intersection with Tatum Road, approximately 0.6 mile northwest on Tatum Road to timber company access road, 0.7 mile northwest on access road to a T, 0.32 mile east and northeast on access road to intersection, 500 feet southeast on access road to a T, approximately 0.5 mile north on access road to Housen Bayou flood plain. Pineland North, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 19 minutes, 17.10 seconds N.; Longitude: 93 degrees, 55 minutes, 5.50 seconds W.

Ap—0 to 2 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure; friable, soft; 10 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron with diffuse boundaries; strongly acid; clear smooth boundary.

Bg1—2 to 18 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable, slightly hard; 10 percent fine prominent strong brown (7.5YR 5/6), and 8 percent coarse faint light yellowish brown (10YR 6/4) masses of reduced iron; 8 percent medium faint light yellowish brown (10YR 6/4) masses of reduced iron; very strongly acid; gradual smooth boundary.

Bg2—18 to 28 inches; light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable, slightly hard; 8 percent fine to coarse distinct masses of oxidized iron with diffuse boundaries; very strongly acid; gradual smooth boundary.

Bg3—28 to 43 inches; grayish brown (10YR 5/2) silty clay loam; weak medium subangular blocky structure; firm, hard; 10 percent medium faint brownish yellow (10YR 6/6), and 1 percent medium prominent strong brown (7.5YR 5/6) masses of oxidized iron; very strongly acid; gradual smooth boundary.

Bg4—43 to 64 inches; grayish brown (10YR 5/2) silty clay loam; massive; firm, hard; 10 percent medium prominent strong brown (7.5YR 5/6), and 10 percent medium faint brownish yellow (10YR 6/6) masses of oxidized iron; very strongly acid; gradual smooth boundary.

Bgb—64 to 80 inches; dark gray (10YR 4/1) silty clay loam; massive; firm, hard; 10 percent fine and medium prominent strong brown (7.5YR 5/6) masses of oxidized iron; very strongly acid.

Range in Characteristics

Soil moisture: An aquic soil moisture regime. The soil is dry in the moisture control section for 50 cumulative days or more in most years.

Mean annual soil temperature: 67 to 70 degrees F

Solum thickness: More than 80 inches

Organic carbon: Irregular distribution between depths of 10 to 50 inches, or 0.2 percent or more at a depth of 50 inches

Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Clay content: 20 to 30 percent

Fine sand and coarser sand content: 4 to 15 percent

Salinity: Nonsaline to very slightly saline throughout the upper 40 inches, and very slightly saline to slightly saline below

Sodium adsorption ratio: 0 to 12 in the upper 40 inches, and 4 to 16 below

CEC/clay ratio: 0.40 to 0.60

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 or 3, where value is 3, the thickness is less than 10 inches
Texture: Silt loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bg or Bgb horizon

Hue: 7.5YR to 2.5Y
Value: 4 to 6
Chroma: 1 or 2, some buried A horizons have value of 3. The dominant subhorizons between a depth of 10 and 30 inches have value of 4 or 5 and chroma of 2.
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Loam, silt loam, or silty clay loam
Iron-manganese: Amount—2 to 5 percent by volume; kind—masses and concretions, in most pedons
Gypsum: Amount—few to 10 percent; kind—crystals in spots or masses; location—mainly in the lower subhorizons
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Rayburn Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from sandstone and siltstone
Geology: Catahoula Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to paralithic bedrock
Shrink-swell potential: High
Slope: 5 to 15 percent

Associated Soils

Kisatchie soils are moderately deep with gray subsoils.

Taxonomic Classification

Fine, smectitic, thermic Vertic Hapludalfs

Typical Pedon

Rayburn loam in an area of Rayburn loam, 5 to 15 percent slopes, in other grass/herbaceous cover, from U.S. Highway 190 in Woodville, 11.9 miles north on U.S. Highway 69, 10.3 miles east on Recreational Road 255; 0.6 mile south on County Road 3825, 1.2 miles east on woods road, and 75 feet north in woods. Pace Hill, Texas USGS 75 minute topographic quadrangle; Latitude: 30 degrees, 58 minutes, 37.10 seconds N.; Longitude: 94 degrees, 14 minutes, 49.50 seconds W.

Ap—0 to 5 inches; dark brown (10YR 3/3) loam; weak fine subangular blocky structure; friable, slightly hard; strongly acid; abrupt wavy boundary.

Bt1—5 to 13 inches; light olive brown (2.5Y 5/6) clay; 5 percent medium distinct brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; extremely firm, extremely hard; 18 percent clay films; very strongly acid; gradual wavy boundary.

Bt2—13 to 21 inches; 35 percent pinkish gray (7.5YR 7/2), 35 percent strong brown (7.5YR 5/8), and 30 percent red (2.5YR 5/8) clay; weak medium subangular blocky structure; extremely firm, extremely hard; 10 percent clay films; very strongly acid; gradual wavy boundary.

Bt3—21 to 33 inches; red (10R 5/8) clay; 5 percent medium prominent light gray (10YR 7/2) mottles; weak medium subangular blocky structure; extremely firm, extremely hard; 5 percent clay films; very strongly acid; gradual wavy boundary.

Bt4—33 to 43 inches; light gray (10YR 7/2) clay; 10 percent medium prominent yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; extremely firm, extremely hard; 3 percent clay films; very strongly acid; gradual wavy boundary.

CB—43 to 52 inches; light gray (2.5Y 7/2) clay; 10 percent medium distinct brownish yellow (10YR 6/8) mottles; extremely firm, extremely hard; extremely acid; gradual wavy boundary.

Cr—52 to 72 inches; light gray (2.5Y 7/2), shale and siltstone bedrock; 10 percent medium faint light gray (2.5Y 7/1) and 10 percent medium prominent yellowish brown (10YR 5/8) mottles; extremely firm, extremely hard; extremely acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 3 to 15 inches
Solum thickness: 40 to 60 inches
Thickness of ochric epipedon: 4 to 15 inches
Depth to paralithic contact: 40 to 60 inches
Base saturation: 35 to 60 percent above the paralithic contact
COLE: 0.09 to 0.14 in the argillic horizon

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, where moist values are less than 3.5, horizon is less than 6 inches thick
Chroma: 1 to 3
Texture: Loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E horizon (where present)

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 2 or 3
Texture: Loamy fine sand, fine sandy loam, or loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Upper Bt horizon

Hue: 5YR to 2.5Y
Value: 4 or 5

Chroma: 3 to 8; or variegated in shades of brown and gray
Lithochromic or relict mottles: Amount—none to few; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown or gray
Texture: Clay or silty clay
Clay content: 40 to 60 percent in the upper 20 inches, but commonly contains up to 70 percent
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Lower Bt horizon and BC horizon

Hue: 10R to 5Y
Value: 5 to 7
Chroma: 2 to 8
Lithochromic or relict mottles: Amount—common to many; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—red and brown; location—in the upper part of the horizon
Lithochromic or relict mottles: Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown, yellow, or gray; location—in the lower part of the horizon
Texture: Clay or silty clay
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

CB horizon

Hue: 10YR to 5Y
Value: 5 to 7
Chroma: 2 or 3
Lithochromic or relict mottles (upper): Amount—common to many; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—red and brown; location—in the upper part of the horizon
Lithochromic or relict mottles (lower): Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown, yellow, or gray; location—in the lower part of the horizon
Texture: Clay or silty clay
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Cr horizon

Lithology: Weakly consolidated tuffaceous shale, siltstone, and sandstone that is bentonitic, but contains volcanic ash, volcanic glass, and other pyroclastic material
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Raylake Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Caddell Formation
Drainage class: Somewhat poorly drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Deep to densic material
Shrink-swell potential: Very high
Slope: 1 to 15 percent

Associated Soils

Herty soils are grayer and have argillic horizons.
Moswell soils have argillic horizons.

Taxonomic Classification

Fine, smectitic, thermic Chromic Dystruderts

Typical Pedon

Raylake clay in an area of Raylake clay, 1 to 5 percent slopes; from the intersection of Farm Road 705 and Farm Road 3172 in southern San Augustine County, approximately 0.7 mile west on Farm Road 3172 to intersection with U.S. Forest Service Road 318, and approximately 400 feet northeast of intersection in compartment #41 of the Angelina National Forest. Norwood, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 10 minutes, 35.80 seconds N.; Longitude: 94 degrees, 8 minutes, 42.70 seconds W.

Ap—0 to 6 inches; dark brown (10YR 3/3) clay; 25 percent medium prominent (2.5Y 3/4), and 2 percent fine prominent red (10R 4/8) mottles; moderate medium subangular blocky structure; very firm, extremely hard, very sticky, very plastic; many fine roots; many fine pores; very strongly acid; clear wavy boundary.

Bss1—6 to 15 inches; brown (7.5YR 4/2) clay; 25 percent medium and coarse prominent dark reddish brown (2.5YR 3/4), and 5 percent fine and medium distinct brown (7.5YR 4/2) mottles; moderate medium subangular blocky structure; very firm, extremely hard, very sticky, very plastic; common fine and medium roots; common fine pores; 10 percent slickensides (pedogenic); 5 percent pressure faces; 5 percent skeletans on slickensides; 1 percent barite masses; strongly acid; gradual wavy boundary.

Bss2—15 to 25 inches; very dark grayish brown (10YR 3/2) clay; 12 percent fine and medium prominent dark reddish brown (5YR 3/4), and 3 percent fine and medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very firm, extremely hard, very sticky, very plastic; common fine roots; common fine pores; 10 percent slickensides (pedogenic); 5 percent pressure faces; 2 percent skeletans on slickensides; strongly acid; gradual wavy boundary.

Bss3—25 to 33 inches; dark grayish brown (10YR 4/2) clay; 10 percent fine and medium prominent strong brown (7.5YR 5/8), 2 percent fine and medium prominent dark red (2.5YR 3/6), and 2 percent fine and medium distinct very pale brown (10YR 7/4) mottles; moderate medium subangular blocky structure; very firm, extremely hard, very sticky, very plastic; common fine roots; common fine pores; 10 percent slickensides (pedogenic); very strongly acid; gradual wavy boundary.

Bss4—33 to 48 inches; brown (7.5YR 4/3) clay; 4 percent fine and medium distinct strong brown (7.5YR 4/6), and 3 percent fine and medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very firm, extremely hard, very sticky, very plastic; common fine roots; common fine pores; 20 percent slickensides (pedogenic); 3 percent skeletans on slickensides; very strongly acid; gradual wavy boundary.

C/Bss—48 to 61 inches; 50 percent brown (10YR 4/3) and 30 percent brown (7.5YR 4/3) clay; 5 percent fine and medium prominent dark reddish brown (5YR 3/2), and 2 percent fine and medium prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very firm, extremely hard, very sticky, very plastic; common fine roots; common fine pores; 10

percent slickensides (pedogenic); 2 percent medium barite masses; very strongly acid; abrupt wavy boundary.

Cd—61 to 80 inches; 40 percent yellowish brown (10YR 5/6) and 30 percent brown (10YR 4/3) clay; 7 percent fine and medium distinct light olive brown (2.5Y 5/6), 5 percent fine and medium faint light yellowish brown (10YR 6/4), 5 percent medium and coarse prominent dark reddish brown (5YR 3/2), and 2 percent fine distinct pale yellow (2.5Y 7/3) mottles; massive; extremely firm, extremely hard; common fine roots in cracks; 2 percent slickensides (pedogenic); 3 percent medium barite masses; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 72 degrees F
Depth to densic contact: 40 to 60 inches
Depth to cambic horizon: 1 to 8 inches
Depth to gypsiferous materials: 11 to 58 inches
Vertic features: Slickensides or wedge-shaped peds at 10 to 24 inches
Cracks to surface: When dry, cracks 0.5 to 1 inch wide extend from the surface to depths of more than 12 inches. Cracks remain open from 60 to 90 cumulative days in most years.
Gilgai: Undisturbed areas have gilgai microrelief with microhighs about 4 to 12 inches above the microlows. Distance from the center of the microhigh to the center of the microlow range from 4 to 15 feet
Mottles: Colors with chroma of 2 or less are considered lithochromic. Colors with chroma of 3 or more are considered to be relict or lithochromic
Solum thickness: 40 to 60 inches
Clay content: 45 to 60 percent

A or Ap horizon

Hue: 7.5 YR or 10YR
Value: 3 or 4
Chroma: 1 to 4
Texture: Clay loam or clay
Clay content: 30 to 45 percent
EC (dS/m): 0 to 2
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bw horizon (where present)

Hue: 2.5YR to 10YR
Value: 4 to 6
Chroma: 2 to 8
Color features: Horizon is often variegated in shades of red and gray
Texture: Clay or silty clay
Clay content: 45 to 60 percent
Pressure faces and slickensides: 0 to 2 percent
Lithochromic or relict mottles: Amount—none to common; shades—red or gray
EC (dS/m): 0 to 2
Reaction: Extremely acid to very strongly acid (3.6 to 5.0)

Bss or C/Bss horizon

Hue: 2.5YR to 10YR
Value: 3 to 6
Chroma: 1 to 8

Color features: Horizon is often variegated in shades of red, yellow, and gray
Texture: Clay or silty clay
Clay content: 45 to 60 percent
Slickensides: 5 to 50 percent
Lithochromic or relict mottles: Amount—none to common; shades—red, yellow, and gray
EC (dS/m): 0.1 to 3
Sodium adsorption ratio: 0 to 4
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Cd or Cdy horizon

Color features: Shades of brown, gray, or olive
Texture: Shale with texture of clay or silty clay
Clay content: 45 to 60 percent
Rock fragments: Shale or mudstone fragments and plates
Gypsum: 1 to 25 percent
EC (dS/m): 2 to 8
Sodium adsorption ratio: 0 to 6
Reaction: Very strongly acid to moderately alkaline (4.5 to 8.4)

Rentzel Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Base slope
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 5 percent

Associated Soils

Iulus soils have coarse-loamy control sections and are on flood plains.
Lilbert soils do not have gray wetness mottles.
Tenaha soils have sola 40 to 60 inches thick.

Taxonomic Classification

Loamy, siliceous, semiactive, thermic Arenic Plinthaquic Paleudults

Typical Pedon

Rentzel loamy fine sand in an area of Rentzel loamy fine sand, 0 to 5 percent slopes, in hardwoods; from the intersection of Farm Road 3448 and Texas Highway 21 west of Geneva, 1.7 miles north on Farm Road 3448 to end of pavement, approximately 1.8 miles north on Boggy Creek Road to Y in road, approximately 0.15 mile northwest on U.S. Forest Service Road 108, and 150 feet north of road in compartment #66 of the Sabine National Forest. Patroon South, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 31 minutes, 39.10 seconds N.; Longitude: 93 degrees, 57 minutes, 0.60 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) loamy fine sand; single grain; very friable, loose; very strongly acid; gradual smooth boundary.

E1—3 to 20 inches; pale brown (10YR 6/3) loamy fine sand; single grain; very friable, loose; very strongly acid; gradual smooth boundary.

E2—20 to 28 inches; pale brown (10YR 6/3) loamy fine sand; single grain; very friable, loose; 1 percent fine distinct masses of oxidized iron with diffuse boundaries; very strongly acid; clear smooth boundary.

Bt1—28 to 38 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; firm, slightly hard; 30 percent clay films; 8 percent medium and coarse prominent red (2.5YR 4/8), and 1 percent medium faint brownish yellow (10YR 6/8) masses of oxidized iron with diffuse boundaries; 10 percent medium distinct light brownish gray (10YR 6/2) masses of reduced iron with diffuse boundaries; very strongly acid; gradual smooth boundary.

Bt2—38 to 50 inches; yellowish red (5YR 4/8), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure parting to weak fine subangular blocky; firm, slightly hard; 25 percent clay films; very strongly acid; gradual smooth boundary.

Btv—50 to 58 inches; yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and red (2.5YR 4/8) fine sandy loam; weak medium subangular blocky structure parting to weak fine subangular blocky; friable, slightly hard; 20 percent clay films; 6 percent plinthite nodules; very strongly acid; gradual smooth boundary.

Btg—58 to 80 inches; gray (10YR 6/1) fine sandy loam; weak medium subangular blocky structure parting to weak fine subangular blocky; friable, slightly hard; 20 percent clay films; 10 percent coarse prominent yellowish brown (10YR 5/6), and 10 percent coarse prominent red (2.5YR 5/8) masses of oxidized iron with diffuse boundaries; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is dry in some or all parts for 75 to 90 days in normal years.
Mean annual soil temperature: 67 to 72 degrees F
Depth to albic horizon: 2 to 20 inches
Depth to argillic horizon: 20 to 40 inches
Depth to redoximorphic concentrations: 20 to 40 inches
Depth to redoximorphic depletions: Within 30 inches of the surface or within 5 inches of the top of the argillic horizon
Depth to horizon with 5 percent or more plinthite: 30 to 59 inches
Depth to episaturation: 18 to 36 inches
Thickness of the sandy epipedon: 20 to 40 inches
Solum thickness: More than 80 inches
Clay content: 15 to 35 percent
Sand content: 50 to 75 percent
CEC/clay ratio: 0.24 to 0.40

A or Ap horizons

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Loamy fine sand
Clay content: 5 to 10 percent
Reaction: Extremely acid to moderately acid (3.6 to 6.0), unless limed

E horizon

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 2 to 4
Texture: Loamy fine sand
Clay content: 5 to 10 percent
Redoximorphic concentrations: Amount—none to few; size—fine or medium; contrast—faint to prominent; boundary—diffuse to clear; shades—brown or yellow
Redoximorphic depletions: Amount—few to many; size—fine or medium; contrast—faint to distinct; boundary—diffuse or clear; shades—gray
Reaction: Extremely acid to moderately acid (3.6 to 6.0), unless limed

Bt horizon

Hue: 5YR to 10YR
Value: 4 to 6
Chroma: 6 or 8, or horizon may be variegated in shades of red, brown, yellow, or gray
Texture: Fine sandy loam or sandy clay loam
Clay content: 15 to 35 percent
Clay films: Location on faces of peds; contrast faint to prominent
Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; location—within the upper 5 inches of the top of the Bt horizon; shades—gray
Plinthite: Amount—0 to 4 percent; kind—nodular
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Btv horizon

Hue: 5YR to 10YR
Value: 5 to 7
Chroma: 1 to 8
Color features: Horizon can be variegated in red, brown, yellow, or gray
Texture: Fine sandy loam or sandy clay loam
Clay content: 15 to 35 percent
Clay films: Location on faces of peds; contrast faint to prominent
Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—gray
Plinthite: 5 to 15 percent nodular
Brittleness: 0 to 10 percent
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Btv/E or Bt/E horizon (where present)

Hue: 5YR to 10YR
Value: 5 to 7
Chroma: 1 to 6
Color features: Horizon may have a variegated matrix of red, brown, yellow, or gray
Texture: Fine sandy loam or sandy clay loam

Clay content: 15 to 35 percent
Clay films: Location on faces of peds; contrast faint to prominent
Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—gray
Plinthite: 0 to 15 percent nodular
Glossic features: 5 to 15 percent, pale brown to gray vertical intrusions of loamy fine sand or fine sandy loam E material
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Btg horizon

Hue: 5YR to 10YR
Value: 4 to 6
Chroma: 1 or 2
Color features: Horizon may be variegated in shades of red, brown, yellow, or gray
Texture: Fine sandy loam or sandy clay loam
Clay content: 15 to 35 percent
Clay films: Location on faces of peds, contrast faint to prominent
Redoximorphic concentrations: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to many; size—fine to coarse; contrast—faint to prominent; boundary—diffuse or clear; location—within the upper 5 inches of the top of the Bt horizon; shades—gray
Plinthite: 0 to 4 percent nodular
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Rosenwall Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Yegua Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Moderately deep to paralithic bedrock
Shrink-swell potential: High
Slope: 1 to 15 percent

Associated Soils

Fuller soils have fine-loamy control sections.
Herty soils have sola 40 to 60 inches thick.
Kurth soils have fine-loamy control sections.

Taxonomic Classification

Very-fine, mixed, thermic Aquic Hapludults

Typical Pedon

Rosenwall fine sandy loam in an area of Rosenwall fine sandy loam, 1 to 5 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 103 and Farm Road 705, approximately 5.7 miles south on Farm Road 705 to U.S. Forest Service property line south of Pisgah Church, approximately 375 feet east on fire lane, and 10 feet north of fire lane in compartment #20 of the Angelina National Forest. Harvey Creek, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 19 minutes, 4.40 seconds N.; Longitude: 94 degrees, 8 minutes, 37.40 seconds W.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam, grayish brown (10YR 5/2), dry; weak fine subangular blocky parting to weak medium subangular blocky structure; friable, soft; strongly acid; clear smooth boundary.

Bt1—4 to 12 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; very firm, very hard; 18 percent clay films; very strongly acid; clear smooth boundary.

Bt2—12 to 19 inches; yellowish red (5YR 4/6) clay; 5 percent fine distinct strong brown (7.5YR 5/6) and 5 percent medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm, very hard; 15 percent clay films; very strongly acid; clear smooth boundary.

BtC—19 to 24 inches; 70 percent dark reddish gray (5YR 4/2) and 30 percent reddish yellow (7.5YR 6/6) stratified loam to clay; weak medium subangular blocky structure; firm, hard; 4 percent clay films; 30 percent sandstone strata; very strongly acid; clear smooth boundary.

CB—24 to 38 inches; very pale brown (10YR 7/3) fine sandy loam; 5 percent medium distinct strong brown (7.5YR 5/8) and 5 percent coarse distinct strong brown (7.5YR 5/8) mottles; massive; firm, hard; 10 percent yellowish red (5YR 4/6) clay films on rock fragments; few ironstone strata; very strongly acid; clear wavy boundary.

Cd—38 to 80 inches; very pale brown (10YR 7/3) fine sandy loam; 1 percent fine distinct yellowish brown (10YR 5/8) and 1 percent medium prominent yellowish red (5YR 5/6) mottles; massive; friable, soft; sandstone with 5 percent grayish brown (10YR 5/2) shale strata; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for as long as 90 cumulative days in normal years.
Mean annual soil temperature: 68 to 72 degrees F
Depth to paralithic contact: 20 to 40 inches
Depth to argillic horizon: 3 to 12 inches
Solum thickness: 20 to 40 inches
Clay content: 60 to 75 percent

A Horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: Fine sandy loam
Clay content: 8 to 20 percent
Rock fragments: 1 to 2 percent
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

E Horizon, (where present)

Hue: 10YR
Value: 5 or 6
Chroma: 3 or 4
Texture: Fine sandy loam
Clay content: 8 to 20 percent
Rock fragments: 0 to 2 percent
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Bt1 Horizon

Hue: 2.5YR or 5YR
Value: 3 to 5
Chroma: 3 to 8
Texture: Clay
Clay content: 60 to 75 percent
Clay films: On ped faces
Lithochromic mottles: Amount—none to common; shades—dark red, strong brown, and light brownish gray
Rock fragments: 0 to 2 percent
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bt2 Horizon

Hue: 2.5YR to 10YR
Value: 3 to 5
Chroma: 2 to 8
Lithochromic mottles: Shades of red, brown, yellow, and gray
Texture: Clay
Clay content: 60 to 75 percent
Clay films: On ped faces
Rock fragments: 0 to 5 percent
Base saturation: Less than 35 percent
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

B/C, BtC, BC, or CB Horizon

Hue: 5YR to 10YR
Value: 4 to 7
Chroma: 1 to 6
Lithochromic mottles: Shades of red, brown, yellow, and gray
Texture: Clay and variable. Some horizons include weakly cemented sandstone or siltstone
Clay films: Location on ped faces or stone fractures, where present
Rock fragments: 0 to 2 percent
Base saturation: Less than 35 percent
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Cd or Cr horizon

Hue: 5YR to 5Y
Value: 4 to 7
Chroma: 2 to 6
Lithology: Soft sandstone with strata of shale
Lithochromic mottles: Shades of red, brown, yellow, and gray
Rock fragments: 0 to 2 percent
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Sacul Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Head slope
Parent material: Clayey residuum weathered from sandstone and shale
Geology: Yegua Formation
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Slow
Soil depth class: Deep to densic material
Shrink-swell potential: High
Slope: 1 to 5 percent

Associated Soils

Alazan soils have fine-loamy control sections.
Bowie soils have fine-loamy control sections.
Kirvin soils do not have gray wetness mottles.

Taxonomic Classification

Fine, mixed, active, thermic Aquic Hapludults

Typical Pedon

Sacul fine sandy loam in an area of Sacul fine sandy loam, 1 to 5 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 103 and Farm Road 705, 4.3 miles south on Farm Road 705 to intersection with U.S. Forest Service Road 303, 0.8 mile east on U.S. Forest Service Road 303 to intersection with U.S. Forest Service Road 307, 1.8 miles east on U.S. Forest Service road 307 to wilderness parking area, 200 feet south of parking area, and 50 feet east in compartment #18 of the Angelina National Forest. Harvey Creek, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 20 minutes, 39.30 seconds N.; Longitude: 94 degrees, 11 minutes, 22.10 seconds W.

Ap—0 to 4 inches; brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable, soft; very strongly acid; gradual smooth boundary.

E—4 to 12 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable, soft; very strongly acid; clear smooth boundary.

Bt1—12 to 18 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, hard; 30 percent clay films; 5 percent fine prominent pale brown (10YR 6/3) iron depletions; 5 percent medium prominent pale brown (10YR 6/3) iron depletions; very strongly acid; gradual smooth boundary.

Bt2—18 to 32 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, hard; 30 percent clay films; 5 percent medium distinct dark yellowish brown (10YR 4/6) masses of oxidized iron; 5 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron; 3 percent fine prominent light brownish gray (10YR 6/2) iron depletions; 2 percent medium prominent light brownish gray (10YR 6/2) iron depletions; very strongly acid; gradual smooth boundary.

Bt3—32 to 39 inches; red (2.5YR 4/8) and light brownish gray (10YR 6/2) clay; moderate medium subangular blocky structure; firm, hard; 30 percent clay films; 10 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron; extremely acid; gradual smooth boundary.

Btg—39 to 53 inches; light brownish gray (10YR 6/2) sandy clay; strong medium subangular blocky structure; firm, hard; 15 percent clay films; 15 percent medium prominent dark red (2.5YR 3/6) masses of oxidized iron; 15 percent coarse prominent dark red (2.5YR 3/6) masses of oxidized iron; 1 percent medium prominent strong brown (7.5YR 5/6) masses of oxidized iron; extremely acid; gradual smooth boundary.

BCg—53 to 62 inches; gray (2.5Y 6/1) clay loam; moderate medium subangular blocky parting to massive; firm, hard; 5 percent medium prominent dark red (10R 3/6) masses of oxidized iron; 5 percent coarse prominent dark red (10R 3/6) masses of oxidized iron; 5 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron; extremely acid; gradual smooth boundary.

Cg—62 to 80 inches; gray (2.5Y 6/1) clay loam; massive parting to platy; firm, hard; 5 percent medium faint gray (2.5Y 5/1) iron depletions; 5 percent medium prominent red (2.5YR 4/8) masses of oxidized iron; 3 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron; 2 percent medium prominent strong brown (7.5YR 5/6) masses of oxidized iron; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 4 to 17 inches
Solum thickness: 40 to more than 80 inches
Depth to paralithic contact: 60 to more than 80 inches
CEC/clay ratio: 0.40 to 0.60
Base saturation: Less than 25 percent at 50 inches below the top of the argillic horizon
Calcium-magnesium ratio: Less than 1
Rock fragments: Amount—0 to 60 percent by volume; kind—ironstone and quartz; size—0 to 3 inches in diameter; location—A and E horizons; Amount—0 to 10 percent; kind—ironstone, quartz, and shale fragments; location—Bt, BC, and C horizons

A horizon (where present)

Hue: 10YR
Value: 3 or 4
Chroma: 2 to 4, where value of 3 or less, horizon is less than 6 inches thick
Texture: Fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Ap horizon

Hue: 7.5YR or 10YR
Value: 4 or 5
Chroma: 3 or 4
Texture: Fine sandy loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E horizon

Hue: 10YR
Value: 5 or 6
Chroma: 3 or 4
Texture: Very fine sandy loam, fine sandy loam, or loamy fine sand
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Upper Bt1 horizon

Hue: 5YR to 10R or 2.5YR
Value: 3 to 5
Chroma: 6 or 8
Texture: Clay
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Middle Bt

Hue: 5YR to 10R or 2.5YR
Value: 3 to 5
Chroma: 6 or 8
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown and gray
Texture: Clay
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Lower Bt horizon

Hue: 5YR or 2.5YR
Value: 3 to 6
Chroma: 6 or 8, or variegated in shades of red, brown, and gray
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown and gray
Texture: Clay
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Btg or BCg horizon

Hue: 10YR or 2.5Y
Value: 5 or 6
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—gray
Texture: Silty clay loam, clay loam, sandy clay loam, or sandy clay
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

BCg or Cg horizon

Hue: 10YR or 2.5Y
Value: 5 or 7
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—gray
Texture: Silty clay loam, clay loam, or loam
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

C horizon

Hue: 5YR or 2.5YR

Value: 3 or 5
Chroma: 6 or 8, or variegated in shades of red, brown, or gray and is stratified. These colors range from about equal to either the red or gray being dominant.
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to distinct; boundary—clear or diffuse; shades—brown and gray
Texture: Clay loam, sandy clay loam, sandy loam, very fine sandy loam, fine sandy loam, silt loam, or silty clay loam
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Sawlit Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Position on landform: Concave or linear areas
Parent material: Loamy alluvium
Geology: Pleistocene terraces
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Very deep
Shrink-swell potential: High
Slope: 0 to 3 percent

Associated Soils

Alazan have aquic conditions in the upper subsoil.
Gallime soils do not have a clayey lower subsoil.

Taxonomic Classification

Fine-loamy, siliceous, active, thermic Aquic Glossudalfs

Typical Pedon

Sawlit fine sandy loam in an area of Sawlit fine sandy loam, 0 to 3 percent slopes; from the intersection of U.S. Highway 69 and U.S. Highway 287 in Woodville, 5 miles east on U.S. Highway 190, 1.1 miles south and east on County Road 4040, 2.1 miles north and east on County Road 4210, bear right at "Y" through pipe-gate on adjoining road 1 mile, and approximately 100 feet north in clearcut to site. Birdwell Lake, Texas USGS 7.5-minute topographic quadrangle; Latitude: 30 degrees, 48 minutes, 32.70 seconds N.; Longitude: 94 degrees, 17 minutes, 14.20 seconds W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium subangular blocky structure; very friable, slightly hard, nonsticky, nonplastic; many fine roots and many medium roots and common coarse roots; common fine and common medium pores; 5 percent fine distinct light yellowish brown (10YR 6/4) wormcasts; very strongly acid; clear wavy boundary.

E—9 to 12 inches; light yellowish brown (10YR 6/4) fine sandy loam; moderate medium subangular blocky structure; very friable, hard, nonsticky, nonplastic; many fine roots and common medium roots and common coarse roots; common fine and common medium pores; 25 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron; 2 percent fine distinct light brownish gray (10YR 6/2) masses of reduced iron; very strongly acid; clear wavy boundary.

Bt/E1—12 to 25 inches; 25 percent reddish yellow (7.5YR 6/8), 20 percent light brownish gray (10YR 6/2), 15 percent light yellowish brown (10YR 6/4), and 15 percent grayish brown (10YR 5/2) sandy clay loam; moderate medium subangular blocky structure; firm, very hard, slightly sticky, slightly plastic; common fine roots and common medium roots; common fine and common medium pores; 15 percent continuous clay films; 10 percent fine distinct yellowish red (5YR 5/8) masses of oxidized iron; 10 percent medium prominent brown (7.5YR 5/4) masses of oxidized iron; 2 percent fine distinct yellowish brown (10YR 5/8) masses of oxidized iron; 15 percent light yellowish brown (10YR 6/4), above is fine sandy loam (E) material; very strongly acid; gradual wavy boundary.

2Bt/E2—25 to 31 inches; 60 percent light brownish gray (10YR 6/2) and 20 percent gray (10YR 6/1) clay loam; moderate medium subangular blocky parting to moderate medium prismatic structure; firm, very hard, moderately sticky, moderately plastic; many fine roots and many medium roots; common fine pores; 10 percent patchy clay films; 10 percent fine distinct strong brown (7.5YR 5/6) masses of oxidized iron; 10 percent fine and medium prominent red (2.5YR 4/8) masses of oxidized iron; 2 percent fine prominent red (10R 4/6) iron-manganese masses; 20 percent light gray (10YR 6/1), above is fine sandy loam (E) material; very strongly acid; gradual wavy boundary.

2Bt/E3—31 to 43 inches; 50 percent light brownish gray (10YR 6/2) and 30 percent light gray (10YR 7/1) clay loam; moderate medium subangular blocky parting to moderate medium prismatic structure; very firm, very hard, moderately sticky, moderately plastic; many fine roots and many medium roots; common fine pores; 5 percent patchy clay films; 10 percent fine and medium prominent red (2.5YR 4/8) masses of oxidized iron; 2 percent fine prominent red (10R 4/6) iron-manganese masses; 2 percent fine and medium distinct yellowish brown (10YR 5/4) masses of oxidized iron; 30 percent light gray (10YR 7/1), above is fine sandy loam (E) material; very strongly acid; gradual wavy boundary.

2Btss/E1—43 to 57 inches; 40 percent gray (10YR 6/1) and 25 percent light gray (10YR 7/1) clay; weak medium subangular blocky parting to moderate medium prismatic structure; extremely firm, extremely hard, very sticky, very plastic; common coarse roots; 5 percent patchy clay films; 20 percent medium and coarse prominent red (2.5YR 4/6) masses of oxidized iron; 10 percent fine and medium distinct brownish yellow (10YR 6/6) masses of oxidized iron; 2 percent fine prominent reddish brown (2.5YR 4/4) iron-manganese masses; 25 percent light gray (10YR 7/1), above is fine sandy loam (E) material; very strongly acid; gradual wavy boundary.

2Btss/E2—57 to 80 inches; 55 percent light gray (10YR 7/1) clay; weak medium subangular blocky parting to weak medium prismatic structure; extremely firm, extremely hard, very sticky, very plastic; 5 percent patchy clay films; 20 percent fine and medium distinct brownish yellow (10YR 6/8) masses of oxidized iron; 20 percent medium and coarse prominent dark reddish brown (2.5YR 3/4) masses of oxidized iron; 2 percent medium prominent dark reddish brown (2.5YR 3/4) iron-manganese masses; 20 percent light gray (10YR 7/1), above is fine sandy loam (E) material; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.

Mean annual soil temperature: 67 to 70 degrees F

Depth to argillic horizon: 14 to 42 inches

Solum thickness: More than 80 inches

Thickness of epipedon: 7 to 20 inches
Depth to clay discontinuity (2Bt horizon): 26 to 40 inches
Clay content: 25 to 35 percent in the upper 20 inches of the argillic horizon
Sand content: 14 to 30 percent fine sand and coarser 6.0
CEC/clay ratio: 0.40 to 0.60
Base saturation: 45 to 75 percent at 50 inches below the top of the argillic horizon

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 or 3
Redoximorphic concentrations: Amount—none to few; size—very fine to fine; contrast—faint to distinct; boundary—clear or diffuse; shades—red or brown; location—as stains along root channels
Texture: Fine sandy loam
Rock fragments: Amount—none to few; kind—rounded ironstone and/or quartzite; size—pebbles
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

E horizon

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 3 or 4
Redoximorphic concentrations: Amount—none to few; size—very fine to fine; contrast—faint to distinct; boundary—clear or diffuse; shades—red or brown; location—as stains along root channels
Redoximorphic depletions: Amount—none to few; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Fine sandy loam
Rock fragments: Amount—none to few; size—pebbles; kind—rounded ironstone and quartzite
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

Bt horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 6 or 8
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray; location—mainly in the lower part of horizon
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: Amount—0 to 4 percent; kind—rounded ironstone and/or quartzite; size—pebbles
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bt/E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 2 to 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown

Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray; location—mainly in the lower part of horizon
Texture: Loam, sandy clay loam, or clay loam
Albic materials (E): 5 to 35 percent
Other features: 0 to 15 percent brittle peds
Rock fragments: Amount—0 to 4 percent; kind—rounded ironstone and/or quartzite; size—pebbles
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

2Bt/E horizon

Hue: 7.5YR or 10YR
Value: 5 or 7
Chroma: 1 or 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray; location—mainly in the lower part of horizon
Texture: Clay loam or clay
Albic materials (E): 15 to 35 percent
Rock fragments: Amount—0 to 4 percent; kind—rounded ironstone and/or quartzite; size—pebbles
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

2Bt horizon (where present)

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 1 to 6
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray; location—mainly in the lower part of horizon, or the horizon is variegated in shades of red and brown.
Albic materials: 0 to 4 percent
Texture: Clay loam or clay
Clay content: 35 to 50 percent clay. The clay content is less than 35 percent and texture is clay loam or sandy clay loam below a depth of 60 inches in some pedons.
Reaction: Extremely acid to strongly acid (3.6 to 5.5)
Other features: Crystals of gypsum and/or fine masses of barite range from none to common

2Btss/E horizon

Hue: 7.5YR or 10YR
Value: 5 or 7
Chroma: 1 to 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray; location—mainly in the lower part of horizon
Texture: Clay loam or clay
Albic materials (E): 15 to 35 percent

Other features: Very few to common slickensides and pressure faces
Rock fragments: Amount—0 to 4 percent; kind—rounded ironstone and/or quartzite; size—pebbles
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Sawtown Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces, marine terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium over clayey residuum weathered from sandstone and shale
Geology: Wilcox Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Very slow
Soil depth class: Very deep
Shrink-swell potential: High
Slope: 0 to 2 percent

Associated Soils

Eastwood and Meth soils have red clayey subsoils.
Gallime soils do not have clayey lower subsoil.
Latex soils do not have thick surface layers.
Maben and Cuthbert soils are 20 to 40 inches deep.
Metcalf and Alazan soils are wetter and do not have thick surfaces.
Mollville and Guyton soils are wetter and gray throughout.

Taxonomic Classification

Fine-loamy, siliceous, active, thermic Typic Glossudalfs

Typical Pedon

Sawtown very fine sandy loam in an area of Metcalf-Sawtown complex, 0 to 2 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 84 and Farm Road 947 in Tenaha, 2.3 miles northwest on Farm Road 947, and 100 feet north in timber on mound. Tenaha West, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 57 minutes, 38.09 seconds N.; Longitude: 94 degrees, 16 minutes, 6.40 seconds W.

A—0 to 11 inches; brown (10YR 5/3) very fine sandy loam; weak medium subangular blocky structure; very friable, soft; common fine and medium roots; 1 percent fine dark grayish brown (10YR 4/2) masses of oxidized iron lining pores; very strongly acid; gradual smooth boundary.

E1—11 to 25 inches; pale brown (10YR 6/3) very fine sandy loam; weak fine subangular blocky structure; very friable, soft; common fine and medium roots; strongly acid; gradual smooth boundary.

E2—25 to 30 inches; pale brown (10YR 6/3) very fine sandy loam; weak medium subangular blocky structure; very friable, soft; common fine and medium roots; 6 percent fine and medium yellowish brown (10YR 5/6) masses of oxidized iron throughout; strongly acid; clear wavy boundary.

Bt/E1—30 to 37 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; firm, very hard; common fine and medium roots; 18 percent by volume streaks and pockets of albic material; 26 percent

distinct clay films on faces of peds; 18 percent pale brown (10YR 6/3) clay depletions; 10 percent fine and medium prominent red (2.5YR 4/6) masses of oxidized iron throughout; Clay depletions are very fine sandy loam tongues of E material; very strongly acid; clear wavy boundary.

Bt/E2—37 to 49 inches; brownish yellow (10YR 6/8) loam; moderate medium subangular blocky structure; firm, very hard; 20 percent by volume streaks and pockets of albic material; 26 percent distinct clay films on faces of peds; 20 percent pale brown (10YR 6/3) clay depletions; 10 percent medium distinct red (2.5YR 4/6) masses of oxidized iron throughout; 1 percent fine faint light brownish gray (10YR 6/2) iron depletions throughout; clay depletions comprised of very fine sandy loam E material; very strongly acid; clear wavy boundary.

2Btg/E—49 to 80 inches; gray (10YR 5/1) clay loam; weak medium subangular blocky structure; very firm, extremely hard; 6 percent distinct clay films on faces of peds; 16 percent pale brown (10YR 6/3) clay depletions; 10 percent fine and medium distinct brownish yellow (10YR 6/6) masses of oxidized iron throughout; 10 percent medium and coarse prominent red (10R 4/8) masses of oxidized iron throughout; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 14 to 42 inches
Solum thickness: More than 80 inches
Thickness of epipedon: 15 to 35 inches
Thickness of glossic horizon: More than 20 inches
Depth to clay discontinuity (2Bt horizon): 40 to 60 inches
Clay content: 18 to 27 percent in the upper 20 inches of the argillic horizon
CEC/clay ratio: 0.40 to 0.60
Base saturation: 45 to 80 percent at 50 inches below the top of the argillic horizon

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 or 3, where value is 3 the thickness is less than 7 inches
Texture: Fine sandy loam, very fine sandy loam, or loam
Rock fragments: Amount—none to few; kind—rounded ironstone or quartzite; size—pebbles
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

E horizon

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 2 to 4
Texture: Fine sandy loam, very fine sandy loam, or loam
Rock fragments: Amount—none to few; kind—rounded ironstone or quartzite; size—pebbles
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bt horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 4 to 8

Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Texture: Loam, sandy clay loam, or clay loam
Other features: None to 15 percent, by volume, brittle peds
Rock fragments: Amount—none to about 4 percent; kind—rounded ironstone or quartzite; size—pebbles
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

Bt/E horizon (is present in some pedons below or instead of the Bt horizon, where present)

B part
Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 4 to 8
Albic materials (E): 5 to 25 percent
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic and clay depletions: Amount—none to few; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray
Texture: Loam, sandy clay loam, or clay loam
Other features: 0 to 15 percent by volume, brittle peds
Rock fragments: Amount—none to about 4 percent; kind—rounded ironstone or quartzite; size—pebbles
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

2Btg/E horizon

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic and clay depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray or variegated in shades of red, brown, and yellow
Albic materials (E): Amount—15 to 25 percent: kind—streaks and pockets
Texture: Clay loam or clay
Clay content: 35 to 50 percent. In some pedons, the clay content is less than 35 percent and texture is clay loam, sandy clay loam, or fine sandy loam below a depth of 60 inches.
Other features: None to common gypsum crystals and fine masses of barite
Reaction: Extremely acid to slightly acid (3.6 to 6.5)

2Btg or 2BCg horizon is below a depth of 60 inches, where present

Hue: 7.5YR or 10YR
Value: 5 or 6
Chroma: 1 or 2
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow

Redoximorphic depletions: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray, or variegated in shades of red, brown, and yellow
Texture: Clay loam or clay
Clay content: 35 to 50 percent. In some pedons, the clay content is less than 35 percent and texture is clay loam, sandy clay loam, or fine sandy loam.
Other features: None to common gypsum crystals and fine masses of barite
Reaction: Extremely acid to slightly acid (3.6 to 6.5)

Smithdale Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Interfluves
Position on landform: Convex or linear areas
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderate
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 1 to 5 percent

Associated Soils

Bowie soils have a yellow subsoil with plinthite.
Lilbert soils are arenic.

Taxonomic Classification

Fine-loamy, siliceous, subactive, thermic Typic Paleudults

Typical Pedon

Smithdale sandy loam in an area of Smithdale sandy loam, 1 to 5 percent slopes, in conifers; from the intersection of Farm Road 3017 and Farm Road 711 (northwest of San Augustine), 6 miles west and north on Farm Road 711 into Shelby County to first County Road on east side of road, 0.8 mile south and east on County Road into Temple-Inland track and curve in road, and 50 feet east in pine plantation. Neuville, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 38 minutes, 8.00 seconds N.; Longitude: 94 degrees, 14 minutes, 42.70 seconds W.

Ap1—0 to 1 inches; brown (10YR 5/3) sandy loam; weak fine subangular blocky structure; friable, soft; common fine roots and common medium roots and few coarse roots; strongly acid; clear smooth boundary.
Ap2—1 to 5 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; friable, soft; common fine roots and common medium roots and few coarse roots; strongly acid; clear smooth boundary.
BE—5 to 11 inches; reddish brown (5YR 5/4) sandy loam; weak fine subangular blocky structure; friable, soft; common fine roots and common medium roots; strongly acid; gradual wavy boundary.
Bt—11 to 36 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly hard; few fine roots and few medium roots; clay bridges; very strongly acid; gradual wavy boundary.

BtC1—36 to 51 inches; red (2.5YR 4/8) fine sandy loam; weak medium subangular blocky and weak fine subangular blocky structure; friable, soft; few fine roots; clay bridges; very strongly acid; gradual wavy boundary.

BtC2—51 to 80 inches; yellowish red (5YR 5/8) fine sandy loam; weak fine subangular blocky structure; friable, soft; clay bridges; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 2 to 18 inches
Solum thickness: 60 to more than 100 inches
CEC/clay ratio: Less than 0.24

A horizon (where present)

Hue: 7.5YR or 10YR
Value: 3 or 4
Chroma: 1 to 3, where chroma is 1 or 2, horizon is less than 5 inches thick
Texture: Sandy loam
Reaction: Very strongly acid to strongly acid (4.5 to 5.5), unless limed

Ap horizon

Hue: 7.5YR or 10YR or 2.5Y
Value: 4 or 5
Chroma: 2 to 6
Texture: Sandy loam
Reaction: Very strongly acid to strongly acid (4.5 to 5.5), unless limed

E horizon (where present)

Hue: 10YR
Value: 5 or 6
Chroma: 2 to 4
Texture: Loamy sand, loamy fine sand, fine sandy loam, sandy loam, or loam
Reaction: Very strongly acid to strongly acid (4.5 to 5.5), unless limed

BA or BE horizon (where present)

Hue: 5YR to 10YR
Value: 4 or 5
Chroma: 4 to 8
Texture: Loamy sand, loamy fine sand, fine sandy loam, sandy loam, or loam
Reaction: Very strongly acid to strongly acid (4.5 to 5.5), unless limed

Upper Bt horizon

Hue: 2.5YR or 5YR
Value: 4 or 5
Chroma: 6 to 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Texture: Clay loam, sandy clay loam, or loam
Clay content: 18 to 33 percent in the upper 20 inches
Silt content: 15 to 45 percent in the upper 20 inches
Reaction: Very strongly acid to strongly acid (4.5 to 5.5), unless limed

Lower Bt horizon (where present)

Hue: 2.5YR or 5YR
Value: 4 or 5
Chroma: 6 to 8
Redoximorphic concentrations: Amount—few to many; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Albic materials: Few to many pockets of pale brown to brownish yellow sand grains
Texture: Sandy loam or loam
Rock fragments: Amount—0 to 10 percent by volume; kind—chert, quartz, or ironstone; size—pebbles
Reaction: Very strongly acid to strongly acid (4.5 to 5.5), unless limed

BtC

Hue: 2.5YR or 5YR
Value: 4 or 5
Chroma: 6 to 8
Redoximorphic concentrations: Amount—few to many: size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red or brown
Texture: Loamy sand, sandy loam, or fine sandy loam
Rock fragments: Amount—0 to 10 percent by volume; kind—chert, quartz, or ironstone; size—pebbles
Reaction: Very strongly acid to moderately acid (4.5 to 6.0), unless limed

Tehran Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberland
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Whitsett Formation
Drainage class: Somewhat excessively drained
Saturated hydraulic conductivity class: Moderately rapid
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 5 to 15 percent

Associated Soils

Kisatchie soils have fine control sections.
Lovelady soils have a lithologic discontinuity.

Taxonomic Classification

Loamy, siliceous, semiactive, thermic Grossarenic Paleudults

Typical Pedon

Tehran loamy sand in an area of Tehran loamy sand 5 to 15 percent slopes, in conifers; in Yellowpine, from the intersection of Farm Road 2426 and Texas Highway 87, 9.8 miles south on Texas Highway 87 to powerline road, 100 feet north on powerline road, and 100 feet west of powerline road. Fairmount, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 10 minutes, 57.50 seconds N.; Longitude: 93 degrees, 43 minutes, 59.70 seconds W.

Ap—0 to 17 inches; brown (10YR 4/3) loamy sand; weak fine subangular blocky structure; very strongly acid; clear wavy boundary.

E1—17 to 26 inches; dark yellowish brown (10YR 4/4) loamy sand; weak fine subangular blocky structure; few clean sand grains; very strongly acid; clear smooth boundary.

E2—26 to 40 inches; yellowish brown (10YR 5/4) loamy sand; weak fine subangular blocky structure; few clean sand grains; very strongly acid; clear wavy boundary.

E3—40 to 59 inches; yellowish brown (10YR 5/4) loamy sand; 5 percent medium faint light yellowish brown (10YR 6/4) and 5 percent medium distinct brown (7.5YR 5/3) mottles; weak fine subangular blocky structure; very strongly acid; clear wavy boundary.

E4—59 to 73 inches; pale brown (10YR 6/3) loamy sand; weak fine subangular blocky structure; very strongly acid; clear smooth boundary.

Bt—73 to 80 inches; strong brown (7.5YR 5/6) sandy loam; 5 percent medium prominent yellowish red (5YR 5/8) mottles; weak fine subangular blocky structure; clay bridges; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 4 to 29 inches
Solum thickness: More than 60 inches
Thickness of sandy epipedon: 40 to 72 inches
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)
Clay content: 18 to 32 percent
Coarse and very coarse sand content: 10 to 25 percent of the sand fraction
CEC/clay ratio: 0.24 to 0.40
Base saturation: 15 to 30 percent at 72 inches below the surface

A horizon

Hue: 10YR
Value: 4 or 5
Chroma: 2 to 4
Texture: Loamy sand
Rock fragments: Amount—0 to 10 percent by volume; kind—quartzite; size—gravel

E horizon

Hue: 10YR
Value: 4 to 7
Chroma: 3 or 4
Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown or yellow
Texture: Loamy sand
Rock fragments: Amount—0 to 10 percent by volume; kind—quartzite; size—gravel

Bt horizon

Hue: 5YR to 2.5YR
Value: 4 to 7
Chroma: 4 to 8

Redoximorphic concentrations: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—red, brown, or yellow
Redoximorphic depletions: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—gray with chroma 2 or less; location—at depths of 60 inches below the surface
Texture: Sandy clay loam or sandy loam
Rock fragments: Amount—0 to 10 percent by volume; kind—quartzite; size—gravel
Plinthite: Amount—0 to 5 percent by volume; kind—segregations

Tenaha Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Loamy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Deep to densic material
Shrink-swell potential: Low
Slope: 1 to 35 percent

Associated Soils

Cuthbert soils do not have the thick sandy surface layer.
Kirvin soils have sola 40 to 60 inches thick.

Taxonomic Classification

Loamy, siliceous, semiactive, thermic Arenic Hapludults

Typical Pedon

Tenaha loamy fine sand in an area of Tenaha loamy fine sand, 5 to 15 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 21 and Farm Road 354 in Denning, 6.2 miles north on Farm Road 354 to County Road 229, 4.2 miles north on County Road 229 to County Road 225, 1.1 miles southeast on County Road 225 to County Road 249, approximately 1,300 feet northeast on County Road 249 to roadcut on north side of County Road. Chireno North, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 36 minutes, 28.20 seconds N.; Longitude: 94 degrees, 16 minutes, 17.80 seconds W.

Ap—0 to 3 inches; dark brown (10YR 3/3) loamy fine sand; weak fine granular parting to single grain; very friable, loose; common fine roots and common medium roots and few coarse roots; strongly acid; clear smooth boundary.
E—3 to 24 inches; yellowish brown (10YR 5/4) loamy fine sand; 10 percent fine faint yellowish brown (10YR 5/6) mottles; weak fine granular parting to single grain; very friable, loose; common fine roots and common medium roots and few coarse roots; strongly acid; clear smooth boundary.
Bt1—24 to 30 inches; dark yellowish brown (10YR 4/6) sandy clay loam; weak fine subangular blocky parting to weak medium subangular blocky structure; friable, slightly hard; common fine roots and common medium roots; 15 percent clay films; very strongly acid; clear smooth boundary.

Bt2—30 to 40 inches; strong brown (7.5YR 5/8) sandy clay loam; 15 percent fine distinct yellowish red (5YR 4/6) and 15 percent medium distinct yellowish red (5YR 4/6) mottles; weak fine subangular blocky parting to weak medium subangular blocky structure; friable, slightly hard; common fine roots and common medium roots and few coarse roots; 10 percent clay films; 1 percent sandstone fragments; very strongly acid; gradual smooth boundary.

BtC—40 to 51 inches; strong brown (7.5YR 5/8) and red (2.5YR 4/6) sandy loam; weak fine subangular blocky structure; friable, soft; 5 percent clay films; very strongly acid; gradual smooth boundary.

Cd—51 to 80 inches; red (2.5YR 4/8) and reddish yellow (7.5YR 6/8) sandy loam; massive; friable, hard; weathered sandstone; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 66 to 70 degrees F
Depth to densic contact: 40 to 60 inches
Depth to albic horizon: 2 to 6 inches
Depth to argillic horizon: 20 to 40 inches
Thickness of the sandy epipedon: 20 to 40 inches
Solum thickness: 40 to 60 inches
Clay content: 23 to 35 percent
Rock fragments: 0 to 14 percent
CEC/clay ratio: 0.24 to 0.40

A or Ap Horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Loamy fine sand
Clay content: 3 to 15 percent
Rock fragments: Amount—0 to 14 percent; kind—ironstone or quartzite; size—gravel
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

E Horizon

Hue: 7.5YR or 10YR
Value: 4 to 7
Chroma: 2 to 4
Texture: Loamy fine sand
Clay content: 3 to 15 percent
Rock fragments: Amount—0 to 14 percent; kind—ironstone or quartzite; size—gravel
Reaction: Very strongly acid to moderately acid (4.5 to 6.0)

Bt Horizon

Hue: 5YR to 10YR
Value: 4 to 6
Chroma: 4 to 8
Texture: Fine sandy loam, sandy clay loam, or clay loam
Clay content: 18 to 35 percent
Clay films: Location—on faces of peds or bridging sand grains; contrast—faint to prominent
Lithochromic mottles: Amount—none to common; size—fine to coarse; contrast—faint to prominent; boundary—clear or sharp; location—in matrix; shades—red, brown, yellow, or gray

Rock fragments: Amount—0 to 14 percent; kind—ironstone or quartzite; size—gravel
Pararock fragments: Amount—0 to 5 percent; kind—remnants of weathered shale
Other features: Some pedons have mica flakes in the lower part
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

BtC or BC Horizon

Hue: 2.5YR to 10YR
Value: 4 to 7
Chroma: 4 to 8
Texture: Sandy loam, fine sandy loam, or sandy clay loam
Clay content: 15 to 35 percent
Clay films: Location—along vertical fractures; contrast—distinct to prominent
Lithochromic mottles: Amount—none to many; size—fine to coarse; contrast—faint to prominent; boundary—clear or sharp; location—in matrix; shades—red, brown, or yellow
Rock fragments: Amount—0 to 14 percent; kind—ironstone or quartzite; size—gravel
Para*rock fragments:* Amount—0 to 15 percent; kind—strata and pockets of weathered shale and sandstone
Other features: Mica flakes range from none to common
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

C or Cd Horizon

Color features: Loamy materials and sandstone are in shades of red, brown, or yellow; the shale materials are in shades of gray
Texture: Stratified sandstone materials have sandy loam, fine sandy loam, or sandy clay loam texture while the shale materials have clay loam or clay texture
Clay content: 15 to 40 percent
Clay films: Location—along vertical fractures
Other features: Many pedons have discontinuous, fractured, strongly cemented or indurated sandstone or ironstone layers about 1 to 4 inches thick. The amount of shale soil material is variable and is absent in some pedons.
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Tonkawa Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Sandy residuum weathered from sandstone and shale
Geology: Carrizo Sand Formation
Drainage class: Excessively drained
Saturated hydraulic conductivity class: Rapid
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 15 percent

Associated Soils

Darco soils have sandy surface layers 40 to 60 inches thick.
Kawah soils are dominantly gray below 40 inches.

Taxonomic Classification

Thermic, coated Typic Quartzipsamments

Typical Pedon

Tonkawa fine sand in an area of Tonkawa fine sand, 0 to 8 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 147 and Farm Road 1279 north of San Augustine, 0.4 mile south on Texas Highway 147, 115 feet west of highway in compartment #51 of the Sabine National Forest. San Augustine East, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 35 minutes, 56.80 seconds N.; Longitude: 94 degrees, 5 minutes, 0.00 seconds W.

A—0 to 15 inches; brown (10YR 5/3) fine sand; single grain; loose, loose; common medium roots; moderately acid; gradual smooth boundary.

C1—15 to 39 inches; very pale brown (10YR 7/3) fine sand; single grain; loose, loose; few medium roots; strongly acid; gradual smooth boundary.

C2—39 to 58 inches; very pale brown (10YR 8/3) fine sand; subangular blocky structure; loose, loose; few medium roots; strongly acid; gradual smooth boundary.

C3—58 to 71 inches; very pale brown (10YR 8/2) fine sand; single grain; loose, loose; strongly acid; gradual smooth boundary.

C4—71 to 80 inches; very pale brown (10YR 8/2) fine sand; 1 percent fine distinct brownish yellow (10YR 6/6) mottles; single grain; loose, loose; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is dry in some or all parts for 125 to 150 days in normal years.
Mean annual soil temperature: 66 to 71 degrees F
Solum thickness: More than 80 inches
Clay content: 2 to 8 percent

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 2 to 4
Texture: Fine sand
Clay content: 2 to 8 percent
Reaction: Extremely acid to moderately acid (3.6 to 6.0)

C horizon

Hue: 7.5YR or 10YR
Value: 5 to 8
Chroma: 2 to 8
Texture: Sand or fine sand
Clay content: 2 to 8 percent
Iron stains: None to common below 60 inches
Reaction: Extremely acid to strongly acid (3.6 to 5.5)

Trawick Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: Unspecified
Landscape: Coastal plains
Landforms: Interfluves
Geomorphic positions, three-dimensional: Side slope
Parent material: Clayey residuum weathered from glauconitic sandstone
Geology: Weches Formation

Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Moderately deep to paralithic bedrock
Shrink-swell potential: Moderate
Slope: 5 to 35 percent

Associated Soils

Hannahatchee are loamy soils on the flood plains.
Nacogdoches soils have sola thicker than 60 inches.
Tenaha soils have sandy surface layers 20 to 40 inches thick.

Taxonomic Classification

Fine, mixed, active, thermic Mollic Hapludalfs

Typical Pedon

Trawick gravelly clay loam in an area of Trawick gravelly clay loam, 5 to 15 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 21 and Farm Road 330 in Geneva, north 0.3 mile on Farm Road 330, approximately 1.5 miles northeast on West Carter Ferry Road, and approximately 300 feet north of road in timber. Geneva, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 29 minutes, 0.44 seconds N.; Longitude: 93 degrees, 53 minutes, 0.52 seconds W.

A—0 to 6 inches; dark brown (10YR 3/3) gravelly clay loam; weak medium subangular blocky structure; friable, slightly hard; few fine, few medium, and common coarse roots; 18 percent nonflat 0.1- to 3.0-inch ironstone nodules; moderately acid; clear smooth boundary.

Bt1—6 to 24 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; firm, hard; few medium and few coarse roots; 25 percent clay films on faces of peds; 5 percent nonflat 0.1- to 3.0-inch ironstone nodules; strongly acid; gradual smooth boundary.

Bt2—24 to 35 inches; red (10R 4/6) clay loam; 10 percent medium and coarse prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, hard; 10 percent clay films on faces of peds; 10 percent nonflat 0.1- to 3.0-inch ironstone nodules; strongly acid; gradual smooth boundary.

BtC—35 to 41 inches; red (2.5YR 4/6) clay loam; 10 percent medium and coarse prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm, hard; 3 percent clay films; 3 percent nonflat 0.1- to 3.0-inch ironstone nodules; strongly acid; gradual smooth boundary.

Cr—41 to 80 inches; strong brown (7.5YR 5/6), glauconitic marl; 1 percent medium prominent red (2.5YR 5/6) and 1 percent coarse prominent red (2.5YR 5/6) mottles; massive; friable, slightly hard; very strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 3 to 10 inches
Solum thickness: 20 to 40 inches
Depth to paralithic contact: 20 to 40 inches
Clay content: 40 to 55 percent
Base saturation: 60 to 90 percent above the paralithic contact

A horizon

Hue: 10R to 5YR
Value: 2 or 3
Chroma: 2 or 3
Texture: Clay loam or gravelly clay loam
Rock fragments: Amount—2 to 35 percent; kind—glauconitic ironstone or ironstone; size—pebbles
Reaction: Moderately acid to neutral (5.6 to 7.3)

Bt horizon

Hue: 10R to 2.5YR
Value: 3 or 4
Chroma: 4 to 8
Texture: Clay loam or clay
Other features: Some pedons have weathered glaconitic materials in the lower part that have colors in shades of brown and yellow
Rock fragments: Amount—2 to 35 percent; kind—glauconitic ironstone or ironstone; size—pebbles
Reaction: Strongly acid to neutral (5.1 to 7.3)

BtC horizon

Hue: 10R to 5YR
Value: 3 to 5
Chroma: 4 to 8
Lithochromic mottles: Amount—few to common; size—fine to medium; contrast—faint to prominent; boundary—clear or diffuse; shades—brown and yellow
Texture: Clay loam or clay
Reaction: Strongly acid to slightly alkaline (5.1 to 7.8)

C horizon (where present)

Lithology: 80 percent or more weathered glaconitic materials, ironstone, and glaconitic marl, and glaconitic greensand
Texture: Clay loam or clay

Cr horizon

Lithology: Glauconite materials, glaconitic marl, and greensand marl with intermittent layers of glauconitic ironstone. These materials are commonly interbedded and weakly cemented.

Tuscosso Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Flood plains
Position on landform: Concave or linear areas
Parent material: Clayey alluvium
Geology: Holocene sediments in Redland areas
Drainage class: Moderately well drained
Saturated hydraulic conductivity class: Moderately slow
Soil depth class: Very deep
Shrink-swell potential: High
Slope: 0 to 1 percent

Associated Soils

Hannahatchee soils have fine-loamy control section.

Taxonomic Classification

Fine, mixed, active, thermic Dystric Fluventic Eutrochrepts

Typical Pedon

Tuscosso loam in an area of Tuscosso loam, 0 to 1 percent slopes, frequently flooded (fig. 11) from the intersection of U.S. Highway 96 and Farm Road 711 in San Augustine, 1.6 miles north on Farm Road 711 to Dr. Bennett farm, from entrance approximately 1.1 miles west and south on farm lane (crossing the creek) to a point 200 feet southeast of the creek crossing; San Augustine West, Texas USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 32 minutes, 52.70 seconds N. Longitude: 94 degrees, 9 minutes, 6.00 seconds W.

Ap—0 to 5 inches; dark brown (10YR 3/3) and brown (10YR 4/3) loam, dry; moderate fine and medium granular and moderate fine subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; many very fine and fine roots; common medium pores; 2 percent fine and medium distinct strong brown (7.5YR 4/6) masses of oxidized iron; slightly acid; clear smooth boundary.

Bw1—5 to 11 inches; 45 percent dark brown (7.5YR 3/3) and 40 percent brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm, hard, slightly sticky, slightly plastic; common very fine and fine, and common medium roots; common very fine and fine pores; 5 percent fine and medium prominent yellowish red (5YR 4/6) masses of oxidized iron; 2 percent iron-manganese nodules; slightly acid; clear irregular boundary.

Bw2—11 to 25 inches; strong brown (7.5YR 4/6) clay loam; moderate medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; common fine and medium roots; common very fine and fine pores; 1 percent distinct organic stains; 10 percent medium prominent brown (10YR 4/3) masses of oxidized iron; 2 percent iron-manganese nodules; 2 percent iron-manganese nodules; slightly acid; clear wavy boundary.

Bw3—25 to 40 inches; dark yellowish brown (10YR 4/6) clay loam; moderate medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; common fine and medium roots; 20 percent medium distinct dark grayish brown (2.5Y 4/2) masses of reduced iron; 1 percent medium prominent yellowish red (5YR 4/6) masses of oxidized iron; 5 percent iron-manganese concretions; 1 percent iron-manganese masses; 1 percent ironstone nodules; slightly acid; gradual wavy boundary.

Bw4—40 to 64 inches; dark yellowish brown (10YR 4/6) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, hard, moderately sticky, moderately plastic; common fine and medium roots; common fine and medium pores; 20 percent medium distinct masses of reduced iron; 1 percent fine and medium distinct masses of oxidized iron; 4 percent fine and medium iron-manganese nodules; moderately acid; gradual wavy boundary.

Bw5—64 to 80 inches; brown (10YR 4/3) clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, hard, moderately sticky, moderately plastic; common fine and medium roots; 4 percent fine and medium prominent masses of oxidized iron; 4 percent fine and medium iron-manganese nodules; 3 percent medium iron-manganese masses; 2 percent subrounded ironstone nodules; slightly acid; clear wavy boundary.

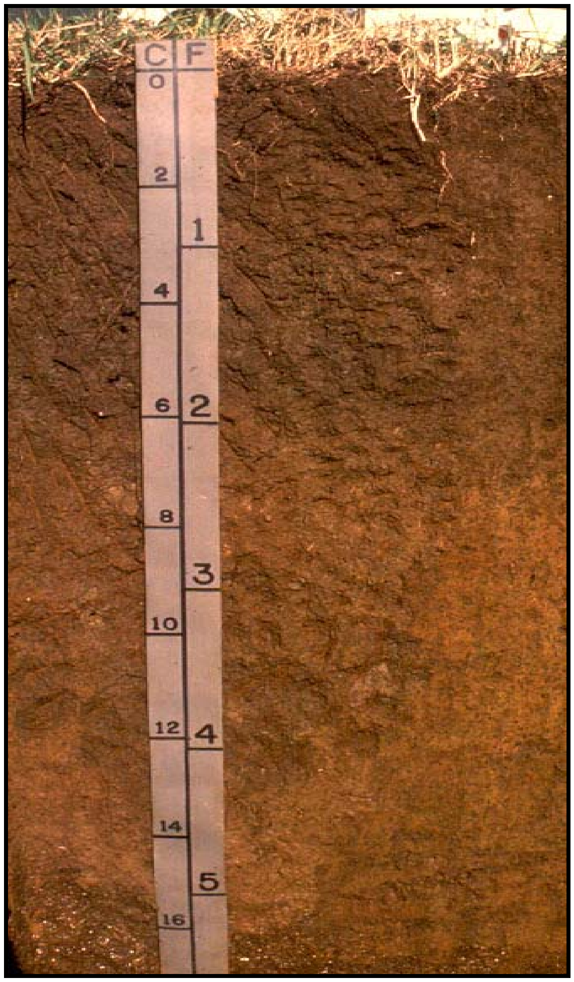


Figure 11.—Profile of Tuscosso loam, 0 to 1 percent slopes, frequently flooded. These alluvial soils drain Redland soils.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 cumulative days in normal years
Mean annual soil temperature: 67 to 71 degrees F
Depth to redoximorphic concentrations: 2 to 60 inches
Depth to redoximorphic depletions: 25 to 77 inches
Depth to episaturation: 30 to 40 inches
Solum thickness: 30 to 60 inches
Clay content: 35 to 55 percent
Silt content: 25 to 50 percent

A horizon

Hue: 5YR to 10YR
Value: 3 or 4
Chroma: 2 to 6
Texture: Loam
Reaction: Strongly acid to neutral (5.1 to 7.3)

AB horizon (where present)

Hue: 10YR
Value: 3
Chroma: 3
Texture: Loam, clay loam, silty clay loam, clay, or silty clay
Clay content: 35 to 55 percent
Reaction: Strongly acid to neutral (5.1 to 7.3)

Upper Bw horizon

Hue: 2.5YR to 7.5YR
Value: 4 or 5
Chroma: 3 to 8
Texture: Clay loam, clay, or silty clay
Clay content: 35 to 55 percent
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—distinct; boundary—clear; shades—brown and yellowish red
Redoximorphic depletions: Amount—none to common; size—fine to medium; contrast—distinct; boundary—clear; shades—brown, gray, or olive
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

Lower Bw horizon

Hue: 7.5YR or 10YR
Value: 4 or 5
Chroma: 3 to 8
Texture: Clay loam, clay, silty clay, or silty clay loam
Clay content: 35 to 55 percent
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—distinct; boundary—clear; shades—brown and yellowish red
Redoximorphic depletions: Amount—none to common; size—fine to medium; contrast—distinct; boundary—clear; shades—brown, gray, or olive
Reaction: Very strongly acid to slightly acid (4.5 to 6.5)

C horizon (where present)

Hue: 2.5YR to 7.5YR
Value: 4 or 5
Chroma: 3 to 8
Texture: Clay loam, clay, or silty clay
Clay content: 35 to 55 percent
Redoximorphic concentrations: Amount—none to common; size—fine to medium; contrast—distinct; boundary—clear; shades—brown and yellowish red
Redoximorphic depletions: Amount—none to common; size—fine to medium; contrast—distinct; boundary—clear; shades—brown, gray, or olive
Gypsum: In most pedons the lower C horizons contain gypsum crystals.
Reaction: Very strongly acid to neutral (4.5 to 7.3)

Woden Series

MLRA: 133B—Western Coastal Plain
Local physiographic area: East Texas Timberlands
Landscape: Coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Parent material: Loamy alluvium

Geology: Pleistocene sediments
Drainage class: Well drained
Saturated hydraulic conductivity class: Moderately rapid
Soil depth class: Very deep
Shrink-swell potential: Low
Slope: 0 to 4 percent

Associated Soils

Bernaldo soils have fine-loamy control sections.
Mollville soils are gray throughout.

Taxonomic Classification

Coarse-loamy, siliceous, semiactive, thermic Typic Paleudalfs

Typical Pedon

Woden fine sandy loam in an area of Woden fine sandy loam, 0 to 4 percent slopes, in intermixed conifers and hardwoods; from the intersection of Texas Highway 83 and Farm Road 3382 in eastern Sabine County, 2.36 miles north and east on Farm Road 3382 to intersection with Gomer Lane, 0.8 mile south on Gomer Lane, 200 feet west in compartment #79 of the Sabine National Forest. Salter Creek, Louisiana USGS 7.5-minute topographic quadrangle; Latitude: 31 degrees, 23 minutes, 37.40 seconds N.; Longitude: 93 degrees, 42 minutes, 5.50 seconds W.

Ap—0 to 5 inches; brown (7.5YR 4/2) fine sandy loam; weak fine granular structure; very friable, soft; many fine and many medium roots; moderately acid; clear smooth boundary.

E—5 to 12 inches; light brown (7.5YR 6/4) fine sandy loam; weak fine subangular blocky structure; very friable, soft; many fine and many medium roots; strongly acid; clear smooth boundary.

Bt1—12 to 17 inches; yellowish red (5YR 5/8) fine sandy loam; 1 percent medium distinct light brown (7.5YR 6/4) mottles; weak medium subangular blocky structure; friable, slightly hard; few fine and few medium roots; few fine and few medium pores; 6 percent clay films; 2 percent clay bridges between sand grains; strongly acid; gradual wavy boundary.

Bt2—17 to 80 inches; red (2.5YR 4/8) fine sandy loam; weak medium subangular blocky structure; friable, slightly hard; few fine and few medium roots; few fine and few medium pores; 6 percent clay films; strongly acid.

Range in Characteristics

Soil moisture: An udic soil moisture regime. The soil moisture control section is not dry in any part for more than 90 days in normal years.
Mean annual soil temperature: 67 to 70 degrees F
Depth to argillic horizon: 4 to 20 inches
Solum thickness: More than 80 inches
Clay content: 12 to 18 percent
Silt content: More than 20 percent
CEC/clay ratio: 0.24 to 0.40
Base saturation: 35 to 60 percent at a depth of 50 inches below the top of the argillic horizon
Rock fragments: Amount—none to few; kind—ironstone and quartzite; size—pebbles; location—throughout

A or Ap horizon

Hue: 2.5YR to 10YR
Value: 3 to 5

Chroma: 2 to 8
Texture: Fine sandy loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

E horizon

Hue: 5YR to 10YR
Value: 5 to 7
Chroma: 2 to 4
Texture: Fine sandy loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

Bt horizon

Hue: 2.5YR to 7.5YR, some pedons have hue of 10YR in lower part
Value: 4 or 5
Chroma: 6 or 8
Redoximorphic concentrations: Amount—none to few; kind—iron accumulations and depletions; shades—brown, red, or yellow
Skeletans: A few streaks or spots of uncoated sand are in the lower part of the Bt horizon
Texture: Fine sandy loam or loam
Reaction: Strongly acid to slightly acid (5.1 to 6.5)

Formation of the Soils

In this section the factors of soil formation are described and related to the formation of the soils of San Augustine and Sabine Counties. Also, the processes of soil formation and the surface geology of the county are described.

Factors of Soil Formation

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The nature of any soil at a given site is the result of the interaction of five general factors; parent material, climate, plants and animals, relief, and time. Climate, plants and animals can have an affect on parent material that is modified by relief over time. Theoretically, if all these factors were identical at different sites, the soils at these sites would be identical. Differences among the soils are caused by variations in one or more of these factors.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It determines the chemical and mineral composition of the soil. The parent material in San Augustine and Sabine Counties consist of unconsolidated, sandy, loamy, and clayey sediments deposited by water during the Oligocene, Eocene, Paleocene, Pleistocene, and Holocene Epochs. The Oligocene deposits are the Catahoula and Whitsett and Nash Creek Formations. The Eocene deposits are the Wilcox Group, Carrizo Sand, Reklaw, Queen City Sand, Weches, and Sparta Sand Formations. The Paleocene is the Wilcox Group undivided. The Pleistocene deposits are the sediments on the different fluviatile terrace levels in areas along the Sabine River, Attoyac River, and other major streams. The Holocene deposits include the recent alluvial material on the bottomlands along the Sabine River, Attoyac River, and along the streams in the county. The soils that formed in these kinds of parent material are identified in the section "Surface Geology."

Climate

The climate of the survey area is humid. Rainfall, evaporation, and temperature are the main climatic influences. The moderate to large amount of rainfall has promoted moderately rapid soil development throughout the survey area. Rainfall is uniform over the area, although its effect is modified locally by runoff caused by slope. Because of the uniformity in climate, the differences between soils are not attributed to climatic differences.

Plant and Animal Life

The vegetation under which a soil forms influences soil properties, such as color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil. Gases derived from root respiration combine with water to form acids that influence the weathering of minerals. Because of a lower content of organic matter, soils that formed under forest vegetation are generally lighter colored than those formed under grasses.

Bacteria, fungi, and many other micro-organisms decompose organic matter and release nutrients to growing plants. They influence the formation of soil structure. Soil properties, such as drainage, temperature, and reaction, influence the type of micro-organisms that live in the soil. Fungi are generally more active in acid soils, while bacteria are more active in less acid or more alkaline soils.

Earthworms, insects, and small burrowing animals mix the soil and create small channels that aid in the soil aeration and water movement. Earthworms help to incorporate crop residue or other organic matter into the soil. The organic matter improves tilth. In areas that are well populated with earthworms, the leaf litter that accumulates is generally incorporated into the soil by the following spring. If the earthworm population is low, part of the leaf can remain on the surface for several years.

Human activity can significantly influence soil formation. The clearing of native forests followed by continuous farming may drastically change activities within the soil. Cultivation generally accelerates erosion on sloping soils, affects soil structure and compaction, and lowers the content of organic matter. Drainage of wet soils changes soil formation. Fertilizer, lime and pesticides also affect soil formation. Developing land for urban use or for mining significantly influences soil development.

Relief

Relief affects soil formation through its influence on drainage, infiltration, and plant cover. It also strongly influences how much water percolates through the soil. Soils on nearly level terraces such as Guyton soils have poor drainage. The strongly sloping to steep Cuthbert soils have thinner solum than the nearby Bowie soils, which are very deep and gently sloping. On steeper slopes, water runs off faster, less moisture infiltrates into the soil, and plant cover is less.

Although most of the soils in San Augustine and Sabine Counties are gently sloping to steep, the development of shallow soils as a result is not common. The abundant rainfall and long warm periods have overcome most of the effects of relief. Nearly all of the soils in the survey area are deeply developed.

Time

The length of time that climate, living organisms, and relief act upon the parent material affects the kind of soil that forms. The effects of time are modified by the other four factors of soil formation. In general, however, soils that do not have definite horizons are considered young or immature. Soils that have well-defined horizons are considered old or mature.

The soils in San Augustine and Sabine Counties range from young to old. Laneville, Owentown, Iulus, and Dreka soils are on flood plains and have little soil horizon development. Bowie, Cuthbert, and Kirvin soils in the uplands are older soils that have distinct horizon development and have little resemblance to the original parent material.

Processes of Soil Formation

Soil forms through complex processes that are grouped into four general categories. These are additions, removals, transfers, and transformations. These processes affect soil formation in differing degrees and account for the presence of soil layers or horizons.

The accumulation of organic matter in the A horizon of the soil in San Augustine and Sabine Counties is an example of an *addition*. This accumulation is the main reason for the dark color of the A horizon. The color of raw parent material is uniform with increasing depth.

The leaching of lime or bases from the upper few feet in many soils is an example of *removal*. The parent material of these soils contains more lime or bases than the soils itself. This indicates leaching of the soil profile by percolating water.

The movement of clay and other material from the A horizon to the B horizon is an example of *transfer*. The E horizon is a zone of maximum eluviation, or loss. The B horizon is a zone of illuviation, or gain. Cuthbert, Lilbert, and many other soils have maximum clay content in the B horizon. An indication of transfer of clay is clay films in pores and on faces of peds.

An example of *transformation* is the reduction of ferrous iron. This process takes place under wet conditions in which there is no molecular oxygen. Gleying, or the reduction of iron, is evident in Guyton and Mollville soils, which have dominantly gray subsoils. The gray color indicates the presence of reduced iron, which in turn implies wetness. Reduced iron is soluble, but it commonly has been moved only short distances in the soils in the survey area, stopping in a lower part of the horizon where it originated or in an underlying horizon. Parts of this iron can be re-oxidized and segregated in the form of stains, concretions, or bright yellow and red redoximorphic concentrations.

Surface Geology

San Augustine and Sabine Counties lies in the western Gulf geomorphic province in which the surface formations dip regionally at very low angles to the Gulf of Mexico. The geology of the area is depicted on the Palestine sheet of the geologic map of Texas.

Tertiary outcrops," bedrock" formations are Paleocene to Eocene in age. Their ages range from about 65 million to about 37 million years before present, respectively. Quaternary surficial deposits, Pleistocene to Holocene in age, parallel the major streams as terraces and flood plains, respectively. The maximum age of Quaternary deposits is about 2.6 million years old.

The oldest rock in the county is the Paleocene-Eocene age Wilcox Group. The lower part of the Eocene age Claiborne Group overlies the Wilcox Group. Claiborne Group formations cropping out in San Augustine and Sabine Counties, from oldest to youngest are Carrizo Sand, Reklaw, Queen City Sand, Weches, Sparta Sand, Cook Mountain, and Yegua Formations. The Jackson Group consists of Cadell and Moody Branch; Manning, Wellborn, and Yazoo; and Whitsett and Nash Creek; and the Gueydan Group that has the Catahoula Formation.

The tertiary formation records a sequence of marine transgression and regression in San Augustine and Sabine Counties. A transgression results in a decrease in land area and an increase in marine sediment deposition. A regression is a retreat of the sea. A regression results in greater land area and an increase in deltaic and fluvial deposition. Most of the Wilcox Group was deposited under regressive conditions; the exception is a partially preserved transgressive stratum at the top of the group. The lower part of the Reklaw Formation, the Newby Member is, transgressive; the upper part, the Marquez Member is regressive. The near shore, shallow-water Weches Formation represents the last transgressions (Adams, 1984; Black, 1968).

Most of the survey areas are on the eastern flank of the Sabine Uplift (Broadfoot, 1963; Buol and others, 1980; Doolittle, 1983). The uplift has elevated and exposed large areas of the older Wilcox Group and the Carrizo Sand as inliers. The western part of the survey area drains in the Attoyac River, and the rest of the survey area drains easterly into Toledo Bend Reservoir.

The relationship between Tertiary "bedrock" formations and Quaternary deposits and their superincumbent soils is complex. Some formations lack definitive or unique lithologies. The sola of some soils, even the C horizon material, may be genetically unrelated to the underlying formations. The uppermost strata in which the soils have

developed may be late Tertiary or Quaternary age, and may be eolian, colluvial, or fluvial origin.

Wilcox Group

The Wilcox Group is not divided into several formations on the geologic maps (Federal Register, 1995; Hurt and others, 2002) as it is elsewhere in east-central Texas (Federal Register 1994).

The Wilcox Group is described as consisting of quartz sand, silt, clay, lignite, and subordinate quantities of glauconite, where present (Federal Register, 1995; Hurt and others, 2002). Glauconite is a fine-grained green hydroxalated iron and potassium mineral-bearing aluminum silicate. Glauconite is an indicator of marine depositional environment. Consequently, the presence of glauconite at the top of the Wilcox group is an indication of the "Sabinetown Formation" stratum. The sands are fluvial channels and point bar origin; the silts are of fluvial overbank origin. A map suggests that most of the Wilcox Group in San Augustine and Sabine Counties belongs to the fluvial overbank facies, which encloses a few narrow elongated southwest-trending channel sand deposits. These sediments were laid down by the early Tertiary age Mount Pleasant Fluvial System flowing from the north and east (Federal Register, 1995).

The part of the Wilcox Group that outcropped in San Augustine and Sabine Counties is overlain by the Eastwood-Metcalf-Sawtown general soil map unit. This area outcrops as a small area in the northwest part of San Augustine County and outcrops in the northeastern part of Sabine County. Most of this area is coincident with the distribution of the Wilcox Group in the southeastern part of Shelby County. The Cuthbert-Tenaha-Bowie and Eastwood-Latex-Sawlit general soil map units cover most of the remainder of the Wilcox outcrops.

The clayey and shaly parent materials of most soils in the Eastwood-Metcalf-Sawtown and the Eastwood-Latex-Sawlit general soil map units are consistent with flood basin or overbank fluvial origin. The minor parts of the Wilcox outcrop area are covered by the Cuthbert-Tenaha-Bowie general soil map unit. The sandy parent materials indicate a fluvial channel facies origin.

The Eastwood-Metcalf-Sawtown general soil map unit is considered soils on terraces. As may be seen on topographic maps, the relationship of these soils to well-defined terraces adjacent to streams is problematical. Perhaps these surface sands were inherited from larger late Tertiary age, pre-Pleistocene stream channels flowing at now obliterated higher surface elevations. These sands were possibly distributed downslope by colluvial processes as the topography was lowered by erosion and reworked in part by wind. The mound-intermound microrelief is indicative of this scenario.

The general soil map units of Eastwood-Metcalf-Sawtown, Cuthbert-Tenaha-Bowie, and Eastwood-Latex-Sawlit are not restricted to the outcrops of the Wilcox-Group.

Claiborne Group

Carrizo Sand Formation

In some places, the Eocene Carrizo Sand Formation unconformably overlies the Wilcox Group. However, in other places, where the "Sabinetown Formation" is present, the contact is conformable. The Carrizo Sand Formation is described as a fine to medium-grained thin-bedded, massive sand (Federal Register, 1995; Hurt and others, 2002) and fluvial in origin.

The Cuthbert-Tenaha-Bowie general soil map unit covers most of the Carrizo Sand outcrop.

Reklaw Formation

The lower part of the Reklaw Formation, the Newby Member, is shallow-water marine or marine shelf in origin and consists of carbonaceous clays and glauconitic sands with marine macrofossils (Broadfoot, 1960; Carmean, 1967). The upper part of the deltaic and near-shore origin. The Marquez Member, is composed mainly of clay and silty clay with thin, locally glauconitic, cross-bedded sand. The scattered areas of Reklaw Formation outcrops are in the northwest part of the survey area and are on the southwest flank of the domal Sabine Uplift.

Most of the Reklaw Formation outcrops underlie small areas of the Cuthbert-Kirvin-Bowie general soil map unit. The soils in this map unit have glauconitic, shaly, and sandy substrates.

Queen City Sand Formation

The Queen City Sand Formation is exposed or out crops as inliers in the Reklaw Formation in the northwestern part of the San Augustine County. The formation is of tidal embayment, tidal delta, and barrier island origins is mostly sand with minor beds of clay; in some places, it is glauconitic.

Weches Formation

The Weches Formation consists of marine glauconitic marl, sand, and clay. It extends from Toledo Bend Reservoir westward to Nacogdoches County along Texas Highway 21. The soils that typically overlie the Weches Formation are of the Nacogdoches-Trawick-Alto general soil map unit.

Sparta Sand Formation

The Sparta Sand Formation consists of very fine and fine quartz sand thought to be continental in origin. The basal sands were laid down on a beach and coastal plain in conjunction with the withdrawal of the Weches Sea. The middle sands are mainly fluviatile deposits spread broadly over flat terrain. The upper sediments were deposited along a transgressing shoreline laid down in advance of the Crockett Sea and were worked over later by marine waters. The soils that typically overlie the Sparta Sand Formation are of the Cuthbert-Tenaha-Bowie general soil map unit.

Cook Mountain Formation

The Cook Mountain Formation consist of soft clays and unconsolidated, fine grained sands which weather to produce a red soil and a more featureless, slightly rolling topography except in areas close to the river where it may be trenched deeply enough to produce good exposers. The Cook Mountain Formation lies upon the Sparta Sand Formation and is overlain by nonmarine beds of the Yegua Formation. The basal contact in most places is sharp and is marked by the contact of laminated, fossiliferous clay interbedded beach sands. The soils that typically overlie the Cook Mountain Formation are of the Moswell-Kurth-Raylake general soil map unit.

Yegua Formation

The Yegua Formation, the youngest unit of the Claiborne Group, has the largest outcrop of any formation in the survey area. It is of fluviodeltaic origin and is a product of regression over the Cook Mountain Formation. Lithologies are clay, quartz sand, and lignite. Almost all of the soils have claystone, mudstone, or shale substrate. The soils that typically overlie the Yegua Formation are of the Moswell-Kurth-Raylake general soil map unit. The Kurth soil substrates may be of fluvial channel or delta distributary origin.

Surface materials here indicate a paleo-drainage system or local eolian depositional origin.

Jackson Group

Cadell and Moody Branch Formations

The Cadell outcrops from Pineland westward to Sam Rayburn Reservoir and the Moody Branch formation outcrops from Pineland eastward to Toledo Bend Reservoir. The Cadell Formation consists of clay and quartz sand. Clay, brown lignitic sand, very-fine grained glauconite, and glauconitic ironstone concretions are common.

The Moody Branch Formation consists of marl, glauconite, and abundant calcareous nodules. It is olive gray or weathered light olive gray, and has an abundance of marine mega fossils (Hurt and others, 2002). The soils that typically overlie these formations are also of the Moswell-Kurth-Raylake general soil map unit.

Manning, Wellborn, and Yazoo Formations

The only formation that is recognized of the three (Hurt and others, 2002) is the Yazoo formation. It outcrops south of Pineland, from Sam Rayburn Reservoir in San Augustine County eastward to Toledo Bend Reservoir in Sabine County. It consists of clay, sands, interbeds of silt and glauconitic sand with marine mega fossils. It is light brownish gray in color. The soils that typically overlie these formations are of the Moswell-Kurth-Raylake general soil map unit.

Whitsett and Nash Creek Formations

The Whitsett and Nash Creek Formations and the uppermost parts of the Jackson Group Epoch age crop out and straddle the southern part of the survey area. These formations originated in deltaic to shallow-water marine shelf areas. They contain bentonitic clays, (weathered and probably reworked volcanic ash), tuffaceous sands and clays, and some thin lignite beds (Hurt and others, 2002; National Research Council, 1995). The soils that typically overlie these formations are of the Kisatchie-Letney-Tehran general soil map unit.

Gueydan Group

Catahoula Formation

The Catahoula Formation is the only member of this group in east Texas, it out crops in the southeastern part of Sabine County. It is the most extensive Tertiary formation with bentonitic and tuffaceous material in East Texas. The Catahoula Formation is largely fluviatile in origin, and consists of channel and point-bar sandstones; levees and crevasses-splay sandstones, siltstones, and mudstones; and flood plain and interchannel siltstones, mudstones, and claystones. These materials contain volcanic ash. Some have weathered to bentonitic clays and are in place or reworked. Others contain reworked volcanic ash. The in-place materials are mainly lacustrine deposits. The soils that typically overlie these formations are of the Kisatchie-Letney-Tehran general soil map unit.

Pimple Mounds

Pimple mounds are circular to elliptical knolls 10 to 75 feet in diameter, and generally are less than 3 feet in height. They are known as mima or prairie mounds in areas other than Texas, Louisiana, and the contiguous states.

In San Augustine and Sabine Counties, pimple mounds are mapped in the Eastwood-Latex-Sawlit, and Gallime-Alazan-Attoyac general soil map units. The Latex, Sawlit, Sawtown, and Gallime soils occur as mounds. The A and E horizons in mounds generally are thicker than the corresponding horizons of the intermound soils. Similar mounds are found in widely scattered localities west of the Mississippi

River. They are located mainly on known Pleistocene age sediments or on thin surficial materials of probable Pleistocene age. They extend southward along the Gulf Coast into northeastern Texas and adjacent Louisiana and northward into southeastern Oklahoma, Arkansas, and southern Missouri. They are found in isolated areas in northwestern Iowa, northwestern Minnesota, and in parts of New Mexico, Colorado, and Wyoming. In the Western states, they occur in parts of Washington, Idaho, and California.

Theories of the origin of pimple mounds have generated an immense and diverse literature (Morrison, 1965). Hypotheses for the genesis of pimple mounds along the Gulf Coast and in northeast Texas are:

(1) Residual hillocks left after wind erosion, sheet flood erosion (possibly with a core of trees-root bonded surficial material), or fluvial erosion.
(2) Accumulations of wind-transported sand, silt, or clay pellets or chips around clumps of vegetation.
(3) Accumulations around or modifications of tree-tip mounds or cradle knolls.
(4) Eolian accumulations whose sites were stated by or topographically enhanced by, erosional processes.
(5) The results of "fluffing up", or the decreasing of the bulk densities, of solum materials and lateral or centripetal transport of surface materials by burrowing animals, such as pockets gophers, with possible eolian increments.

Hypothesis (federal register, 1994 and1995) involving eolian effects seem the most plausible for the Gulf coast and northeast Texas mounds. Eolian accumulation suggests a partly non-pedogenic origin for the thickened A and E horizons and perhaps drier climates than at present.

Holocene Alluvium

The term "Holocene" has been defined as covering the past 10,000 years (Cowardin and others, 1979; Khasawneh and others, 1980). Locally, this is the time of flood plain sediment deposition along streams. These streams include the Attoyac (Bayou) River as the western boundary and its flood plain as part source of Sam Rayburn Reservoir and the Sabine River, which is the northeastern boundary line and source of Toledo Bend Reservoir. Ayish Bayou in the center of San Augustine County, and Sandy Creek, flow into Sam Rayburn Reservoir. The Sabine River, which is the northeastern boundary line.

Most flood plain sediments are parent materials for soils of Laneville, Iulus, Dreka and the Mattex-Laneville general soil map unit. Most flood plain soils are considered to be frequently or occasionally flooded for brief to long durations.

References

Adams, F. 1984. Soil acidity and liming. American Society of Agronomy, Agronomy Monograph 12, 2nd edition.

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Black, C.A. 1968. Soil-plant relationships. 2nd edition.

Broadfoot, Walter M. 1960. Field guide for evaluating cottonwood sites. U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station Occasional Paper 178.

Broadfoot, Walter M. 1963. Guide for evaluating water oak sites. U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station Research Paper SO-1.

Buol, S.W., F.D. Hole, and R.J. McCracken. 1980. Soil genesis and classification. 3rd edition.

Carmean, Willard H. 1967. Soil survey refinements for predicting black oak site quality in southeastern Ohio. Soil Science Society of America Proceedings 31: 805-810.

Doolittle, James A. 1982. Characterizing soil map units with the ground-penetrating radar. Soil Survey Horizons 23(4): 3-10.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. February 24, 1995. Hydric soils of the United States.

Hurt, G.W., P.M. Whited, and R.F. Pringle, editors. Version 5.0, 2002. Field indicators of hydric soils in the United States.

Khasawneh, F.E., E.C. Sample, and E.J. Kamprath, editors. 1980. The role of phosphorus in agriculture. American Society of Agronomy.

Morrison, R.B. 1965. Quaternary geology of the Great Basin. *In* The Quaternary of the United States, pp. 265-285.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. **http://soils.usda.gov/technical/**

Soil Survey Staff. 2003. Keys to soil taxonomy. 9th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. 1996. Soil survey laboratory methods manual. Soil Survey Investigations Report 42, Version 3.0. **http://soils.usda.gov/technical/**

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.
Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.
Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.
Bottomland. The normal flood plain of a stream, subject to flooding.
Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.
Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
Canopy. The leafy crown of trees or shrubs. (See Crown.)
Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.
Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.
Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.
Chemical treatment. Control of unwanted vegetation through the use of chemicals.
Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.
Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.
Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.
Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.
Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
Coarse textured soil. Sand or loamy sand.
Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop resibecause of the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop resibecause of the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained*, and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Ecological site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the

field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A, O, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—f*aint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan*, and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Very slow	less than .06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Pleistocene. The epoch of the Quaternary Period of geologic time, following the Pliocene Epoch and preceding the Holocene (from about 2 million to 10 thousand years ago); also the corresponding (time-stratigraphic) “series” of earth materials.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike. All the soils of a given series have horiizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by induration of a clay, silty clay, or silty clay loam deposit and having the tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 1 percent
Very gently sloping	1 to 3 percent
Gently sloping	3 to 5 percent
Moderately sloping	5 to 8 percent
Strongly sloping	8 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 45 percent
Very steep	45 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a footslope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Underlying material. The part of the soil below the solum.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation--San Augustine and Broaddus

(Recorded for the period 1971-2000 at Broaddus, Texas)

Month	Temperature (Degrees F)						Precipitation (Inches)			
				2 years in 10 will have		Average number of growing degree days*		2 years in 10 will have		Average number of days w/0.1 or more
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than		Average	less than	more than	
January	51.0	31.5	41.2	75	12	46	5.80	2.40	8.86	7
February	55.7	33.0	44.3	82	17	72	4.53	1.75	7.32	5
March	68.7	41.8	55.3	83	24	210	4.09	2.48	5.73	5
April	77.2	51.4	64.3	87	37	432	3.45	1.50	5.40	4
May	84.3	60.5	72.4	96	47	679	4.61	1.64	7.70	6
June	91.3	67.4	79.3	100	53	880	4.59	2.02	6.43	6
July	95.4	71.4	83.4	103	62	1,034	2.95	1.26	4.68	4
August	93.7	70.1	81.9	102	65	990	3.79	1.29	6.33	4
September	87.9	65.6	76.7	97	51	802	4.09	1.83	6.14	4
October	82.3	51.9	67.1	95	36	519	3.72	1.09	5.88	4
November	69.4	44.9	57.1	85	22	245	4.81	2.10	6.82	6
December	61.6	35.2	48.4	82	18	85	5.45	3.83	6.92	6
Yearly:	---	---	---	---	---	---	---	---	---	---
Average	76.5	52.1	64.3	---	---	---	---	---	---	---
Extreme	104	12	---	103	12	---	---	---	---	---
Total	---	---	---	---	---	5,996	51.88	38.04	60.51	61

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F).

Table 2.--Temperature and Precipitation--San Augustine, Bronson, and Pinedale

(Recorded in the period 1971-2000 at San Augustine, Bronson, and Pinedale Texas)

Month	San Augustine Temperature (Degrees F)						San Augustine Precipitation (Inches)				Bronson Precipitation (Inches)				Pinedale Precipitation (Inches)			
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have: Maximum temperature higher than	2 years in 10 will have: Minimum temperature less than	Average number of growing degree days*	Average	2 years in 10 will have: less than	2 years in 10 will have: more than	Average number of days w/0.1 or more	Average	2 years in 10 will have: less than	2 years in 10 will have: more than	Average number of days w/0.1 or more	Average	2 years in 10 will have: less than	2 years in 10 will have: more than	Average number of days w/0.1 or more
January	51.0	31.5	41.2	75	12	46	4.96	2.36	7.19	6	**5.14**	**1.99**	**8.42**	**7**	**5.66**	**2.16**	**8.58**	**6**
February	55.7	33.0	44.3	82	17	72	4.60	2.02	7.18	5	**3.37**	**1.59**	**4.97**	**4**	**4.29**	**2.21**	**6.21**	**5**
March	68.7	41.8	55.3	83	24	210	4.30	2.43	6.17	6	**5.37**	**2.36**	**8.58**	**7**	**4.79**	**2.98**	**6.59**	**5**
April	77.2	51.4	64.3	87	37	432	4.08	1.71	6.16	5	**3.81**	**1.17**	**6.73**	**4**	**4.31**	**1.78**	**6.71**	**5**
May	84.3	60.5	72.4	96	47	679	5.89	2.72	8.91	6	**4.89**	**2.04**	**7.14**	**5**	**5.08**	**2.66**	**7.58**	**6**
June	91.3	67.4	79.3	100	53	880	4.90	2.38	7.01	6	**4.99**	**1.92**	**7.41**	**5**	**5.52**	**2.48**	**8.06**	**6**
July	95.4	71.4	83.4	103	62	1,034	3.07	1.50	4.73	5	**4.13**	**2.51**	**5.85**	**7**	**3.54**	**1.81**	**5.02**	**5**
August	93.7	70.1	81.9	102	65	990	3.64	0.97	6.17	4	**3.22**	**2.28**	**4.21**	**6**	**3.14**	**1.05**	**4.84**	**4**
September	87.9	65.6	76.7	97	51	802	4.55	2.81	5.95	5	**4.45**	**2.89**	**6.04**	**7**	**3.61**	**1.55**	**5.23**	**4**
October	82.3	51.9	67.1	95	36	519	4.09	1.43	6.40	4	**3.95**	**1.56**	**6.54**	**4**	**4.51**	**1.33**	**6.60**	**4**
November	69.4	44.9	57.1	85	22	245	4.97	2.58	7.08	6	**5.16**	**3.55**	**6.12**	**5**	**5.13**	**2.12**	**7.90**	**5**
December	61.6	35.2	48.4	82	18	85	5.24	3.26	7.11	6	**5.39**	**3.71**	**7.04**	**6**	**5.39**	**3.37**	**7.45**	**6**
Yearly:	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Average	76.5	52.1	64.3	---	---	---	---	---	---	---	-----	----	----	-----	-- ----	----	----	---
Extreme	104	12	---	103	12	---	---	---	---	---	-----	----	----	-----	-- ----	----	----	---
Total	---	---	---	---	---	5,996	54.31	35.94	63.97	64	**53.86**	**37.37**	**57.03**	**67**	**54.99**	**46.11**	**63.58**	**61**

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F).

Table 3.--Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Broaddus, Texas)

Probability	Daily Minimum Temperature		
	Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
	Days	Days	Days
First freezing temperature in fall			
1 year in 10 earlier than--	November 26	November 8	November 1
2 years in 10 earlier than--	December 1	November 14	November 7
5 years in 10 earlier than--	December 10	November 26	November 18

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Sabine County	San Augustine County	Total	
				Area	Extent
		Acres	Acres	Acres	Pct
AaB	Alazan fine sandy loam, 0 to 2 percent slopes	1,494	2,215	3,709	0.5
AbA	Alazan-Besner complex, 0 to 2 percent slopes-	2,787	4,936	7,723	1.0
AtA	Alto clay loam, 1 to 3 percent slopes--------	542	7,820	8,362	1.1
AtB	Attoyac fine sandy loam, 0 to 4 percent slopes------------------------------------	3,902	2,698	6,600	0.9
AuD	Austonio fine sandy loam, 5 to 12 percent slopes------------------------------------	735	1,985	2,720	0.4
BaB	Bernaldo fine sandy loam, 0 to 3 percent slopes------------------------------------	2,120	2,636	4,756	0.6
BeA	Besner fine sandy loam, 0 to 3 percent slopes	297	157	454	*
BfA	Betis loamy fine sand, 0 to 8 percent slopes-	558	1,881	2,439	0.3
BoC	Bowie fine sandy loam, 1 to 5 percent slopes-	4,510	6,829	11,339	1.5
BuB	Bub clay loam, 2 to 5 percent slopes---------	1,258	2,043	3,301	0.4
ChA	Chireno clay loam, 0 to 2 percent slopes-----	37	457	494	*
CoB	Corrigan fine sandy loam, 1 to 5 percent slopes------------------------------------	829	177	1,006	0.1
CrG	Cuthbert soils, 5 to 15 percent slopes, graded------------------------------------	4	12	16	*
CtE	Cuthbert fine sandy loam, 5 to 15 percent slopes------------------------------------	12,611	26,125	38,736	5.2
CtG	Cuthbert fine sandy loam, 15 to 35 percent slopes------------------------------------	3,715	799	4,514	0.6
CtS	Cuthbert gravelly fine sandy loam, 15 to 35 percent slopes, stony----------------------	288	131	419	*
CuE	Cuthbert gravelly fine sandy loam, 5 to 15 percent slopes----------------------------	2,958	694	3,652	0.5
DaC	Darco loamy fine sand, 1 to 8 percent slopes-	776	3,861	4,637	0.6
DaE	Darco loamy fine sand, 8 to 15 percent slopes	449	1,890	2,339	0.3
DsA	Dreka loam, frequently flooded---------------	5,447	0	5,447	0.7
EeB	Eastwood very fine sandy loam, 1 to 5 percent slopes------------------------------------	14,206	8,896	23,102	3.1
EeD	Eastwood very fine sandy loam, 5 to 15 percent slopes----------------------------	7,957	5,305	13,262	1.8
ElA	Eastwood-Latex complex, 1 to 3 percent slopes, mounded----------------------------	945	830	1,775	0.2
EtB	Etoile loam, 1 to 5 percent slopes-----------	2,602	1,695	4,297	0.6
EtD	Etoile fine sandy loam, 5 to 15 percent slopes------------------------------------	431	251	682	*
GaA	Gallime-Alazan Complex, 0 to 2 percent slopes	2,662	264	2,926	0.4
GaB	Gallime very fine sandy loam, 1 to 3 percent slopes------------------------------------	725	709	1,434	0.2
GaC	Gallime-Guyton complex, 0 to 2 percent slopes	3,238	521	3,759	0.5
GrB	Grapeland loamy fine sand, 1 to 5 percent slopes------------------------------------	76	704	780	0.1
GtA	Guyton silt loam, 0 to 1 percent slopes------	86	188	274	*
GuA	Guyton-Sawtown complex, mounded--------------	1,239	1,636	2,875	0.4
HaA	Hainesville loamy fine sand, 0 to 2 percent slopes------------------------------------	51	64	115	*
Hc	Hannahatchee loam, 0 to 1 percent slopes, occasionally flooded------------------------	1,367	2,663	4,030	0.5
HeB	Herty loam, 0 to 3 percent slopes------------	2,670	1,105	3,775	0.5
Ia	Iulus fine sandy loam, 0 to 1 percent slopes, occasionally flooded------------------------	5,944	6,676	12,620	1.7
Iu	Iulus fine sandy loam, 0 to 1 percent slopes, frequently flooded-------------------------	1,541	978	2,519	0.3
KhB	Kirvin fine sandy loam, 1 to 5 percent slopes	8,775	16,622	25,397	3.4
KiC	Kirvin gravelly fine sandy loam, 1 to 5 percent slopes-----------------------------	2,503	2,579	5,082	0.7
KiD	Kirvin soils, 2 to 8 percent slopes, graded--	425	897	1,322	0.2

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Sabine County	San Augustine County	Total Area	Total Extent
		Acres	Acres	Acres	Pct
KkD	Kisatchie loam, 5 to 15 percent slopes-------	2,017	0	2,017	0.3
KuB	Kurth fine sandy loam, 1 to 3 percent slopes-	6,208	5,205	11,413	1.5
KwA	Kawah fine sand, 0 to 2 percent slopes-------	0	492	492	*
La	Laneville loam, 0 to 1 percent slopes, occasionally flooded------------------------	5,885	918	6,803	0.9
LaB	LaCerda clay loam, 0 to 5 percent slopes-----	759	3,087	3,846	0.5
LaE	LaCerda clay loam, 5 to 15 percent slopes----	34	1,475	1,509	0.2
Lb	Laneville loam, 0 to 1 percent slopes, frequently flooded--------------------------	8,541	8,678	17,219	2.3
LdB	Latex fine sandy loam, 1 to 3 percent slopes-	3,524	5,362	8,886	1.2
LiB	Letney loamy sand, 1 to 5 percent slopes-----	3,844	0	3,844	0.5
LiC	Lilbert loamy fine sand, 1 to 5 percent slopes--------------------------------------	2,293	7,723	10,016	1.3
LiD	Letney loamy sand, 5 to 15 percent slopes----	469	0	469	*
LnB	Lovelady loamy fine sand, 1 to 5 percent slopes--------------------------------------	711	2,073	2,784	0.4
LnD	Lovelady loamy fine sand, 5 to 8 percent slopes--------------------------------------	118	879	997	0.1
MaE	Maben fine sandy loam, 5 to 15 percent slopes	6,744	1,649	8,393	1.1
MaG	Maben fine sandy loam, 15 to 35 percent slopes--------------------------------------	957	409	1,366	0.2
Mf	Mattex clay loam, 0 to 1 percent slopes, frequently flooded--------------------------	464	2,215	2,679	0.4
MhC	Meth fine sandy loam, 1 to 5 percent slopes--	2,374	202	2,576	0.3
Mi	Mattex-Iulus complex, 0 to 1 percent slopes, frequently flooded--------------------------	9,233	19,288	28,521	3.8
MiQ	Mine or Quarry------------------------------	205	83	288	*
MiS	Metcalf-Sawtown complex, 0 to 2 percent slopes--------------------------------------	16,513	13,730	30,243	4.0
MpA	Mollville-Besner complex, 0 to 1 percent slopes, mounded----------------------------	1,442	1,137	2,579	0.3
MsB	Moswell loam, 1 to 5 percent slopes----------	37,764	24,604	62,368	8.3
MsD	Moswell loam, 5 to 15 percent slopes---------	24,002	17,537	41,539	5.6
NaB	Naclina clay loam, 1 to 5 percent slopes-----	626	294	920	0.1
NaD	Naclina clay, 5 to 15 percent slopes---------	67	117	184	*
NeB	Nacogdoches fine sandy loam, 1 to 5 percent slopes--------------------------------------	2,869	9,399	12,268	1.6
NeE	Nacogdoches clay loam, 1 to 5 percent slopes-	3,584	12,155	15,739	2.1
Ow	Owentown fine sandy loam, occasionally flooded-------------------------------------	974	1,406	2,380	0.3
PeC	Penning-Kurth complex, 0 to 2 percent slopes-	7,717	6,611	14,328	1.9
PoA	Pophers silt loam, 0 to 1 percent slopes, frequently flooded--------------------------	2,220	0	2,220	0.3
RaD	Rayburn loam, 5 to 15 percent slopes---------	1,497	204	1,701	0.2
RkB	Raylake clay, 1 to 5 percent slopes----------	8,755	4,455	13,210	1.8
RkD	Raylake clay loam, 5 to 15 percent slopes----	198	1,810	2,008	0.3
RnB	Rentzel loamy fine sand, 0 to 5 percent slopes--------------------------------------	1,544	4,866	6,410	0.9
RsB	Rosenwall fine sandy loam, 1 to 5 percent slopes--------------------------------------	8,004	1,848	9,852	1.3
RsD	Rosenwall fine sandy loam, 5 to 15 percent slopes--------------------------------------	2,856	1,447	4,303	0.6
SaB	Sacul fine sandy loam, 1 to 5 percent slopes-	2,801	5,134	7,935	1.1
SeB	Sawlit fine sandy loam, 0 to 3 percent slopes	7,733	3,472	11,205	1.5
SfA	Sawtown very fine sandy loam, 0 to 2 percent slopes--------------------------------------	2,686	299	2,985	0.4
SmB	Smithdale sandy loam, 1 to 5 percent slopes--	2,456	2,729	5,185	0.7
TeD	Tehran loamy sand 5 to 15 percent slopes----	4,296	0	4,296	0.6
TnB	Tenaha loamy fine sand, 1 to 5 percent slopes	3,578	13,551	17,129	2.3

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Sabine County	San Augustine County	Total Area	Total Extent
		Acres	Acres	Acres	Pct
TnD	Tenaha loamy fine sand, 5 to 15 percent slopes	3,789	12,549	16,338	2.2
TnG	Tenaha loamy fine sand, 15 to 35 percent slopes	53	1,189	1,242	0.2
TsB	Tonkawa fine sand, 0 to 8 percent slopes	0	781	781	0.1
TsD	Tonkawa fine sand, 8 to 15 percent slopes	0	508	508	*
Tu	Tuscosso loam, 0 to 1 percent slopes, frequently flooded	2,066	5,967	8,033	1.1
TuD	Trawick gravelly clay loam, 5 to 15 percent slopes	7,248	9,539	16,787	2.2
TuG	Trawick clay loam, 15 to 35 percent slopes	503	267	770	0.1
WeB	Woden fine sandy loam, 0 to 4 percent slopes	185	159	344	*
W	Water	54,421	40,930	95,351	12.7
	Total	369,587	378,361	747,948	100.0

* Less than 0.1 percent.

Table 5.--Non-Irrigated Yields by Map Unit Component

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Bahiagrass	Common bermudagrass	Grain sorghum	Improved bermudagrass	Peanuts
		AUM	AUM	Bu	AUM	Lbs
AaB:						
Alazan	2w	6.00	5.00	---	7.00	---
AbA:						
Alazan	2w	6.00	5.00	---	7.00	---
Besner	2e	7.00	---	80.00	9.00	---
AtA:						
Alto	2e	8.50	7.50	---	8.00	---
AtB:						
Attoyac	2e	7.00	6.00	---	10.00	2,500.00
AuD:						
Austonio	6e	6.00	5.00	---	7.00	---
BaB:						
Bernaldo	2e	8.00	7.00	70.00	10.00	2,500.00
BeA:						
Besner	2e	7.00	---	80.00	9.00	---
BfA:						
Betis	3s	---	---	---	3.00	1,700.00
BoC:						
Bowie	3e	6.00	5.00	---	7.00	---
BuB:						
Bub	7s	---	---	---	---	---
ChA:						
Chireno	2s	9.00	8.00	---	9.00	---
CoB:						
Corrigan	4e	4.50	4.00	---	---	---
CrG:						
Cuthbert	6e	---	1.00	---	2.00	---
CtE:						
Cuthbert	6e	2.00	2.00	---	3.00	---
CtG:						
Cuthbert	7e	---	---	---	---	---
CtS:						
Cuthbert	7s	---	---	---	---	---
CuE:						
Cuthbert	6e	2.00	1.00	---	2.00	---
DaC:						
Darco	3s	---	---	---	3.00	1,000.00

Table 5.--Non-Irrigated Yields by Map Unit Component--Continued

Map symbol and soil name	Land capability	Bahiagrass	Common bermudagrass	Grain sorghum	Improved bermudagrass	Peanuts
		AUM	AUM	Bu	AUM	Lbs
DaE:						
Darco	6e	---	---	---	2.00	---
DsA:						
Dreka	5w	2.00	2.00	---	2.00	---
EeB:						
Eastwood	4e	6.00	6.00	---	7.50	---
EeD:						
Eastwood	6e	5.50	5.50	---	6.50	---
ElA:						
Eastwood	3e	5.50	5.50	---	6.50	---
Latex	2e	8.00	7.00	---	10.00	---
EtB:						
Etoile	4e	5.00	---	---	5.00	---
EtD:						
Etoile	6e	5.00	---	---	6.00	---
GaA:						
Gallime	2e	8.00	7.00	---	9.00	---
Alazan	2w	6.00	5.00	---	7.00	---
GaB:						
Gallime	2e	8.00	7.00	---	9.00	---
GaC:						
Gallime	2e	8.00	7.00	---	9.00	---
Guyton	3w	6.50	5.00	---	---	---
GrB:						
Grapeland	3s	---	---	---	6.00	2,400.00
GtA:						
Guyton	3w	6.50	5.00	---	---	---
GuA:						
Guyton	3w	6.50	5.00	---	---	---
Sawtown	2e	7.00	6.00	---	9.00	---
HaA:						
Hainesville	3s	6.50	7.00	---	11.00	---
Hc:						
Hannahatchee	2w	---	---	---	6.00	---
HeB:						
Herty	3e	5.00	4.00	---	5.00	---
Ia:						
Iulus	2w	8.50	7.00	---	9.00	---

Table 5.--Non-Irrigated Yields by Map Unit Component--Continued

Map symbol and soil name	Land capability	Bahiagrass	Common bermudagrass	Grain sorghum	Improved bermudagrass	Peanuts
		AUM	AUM	Bu	AUM	Lbs
Iu:						
Iulus	5w	7.00	6.00	---	8.00	---
KhB:						
Kirvin	3e	---	---	40.00	6.00	---
KiC:						
Kirvin	3e	4.00	3.00	---	5.00	---
KiD:						
Kirvin	6e	2.00	2.00	---	3.00	---
KkD:						
Kisatchie	6e	4.00	3.50	---	8.00	---
KuB:						
Kurth	2e	9.00	6.00	---	10.00	---
KwA:						
Kawah	3w	---	---	---	4.00	---
La:						
Laneville	2w	7.00	7.00	---	9.00	---
LaB:						
LaCerda	3e	5.00	---	---	5.00	---
LaE:						
LaCerda	6e	4.00	---	---	5.00	---
Lb:						
Laneville	5w	6.00	6.00	---	8.00	---
LdB:						
Latex	2e	8.00	7.00	---	10.00	---
LiB:						
Letney	3s	6.50	---	---	6.00	---
LiC:						
Lilbert	3e	3.00	---	---	4.00	1,500.00
LiD:						
Letney	6e	5.00	---	---	5.00	---
LnB:						
Lovelady	2e	5.00	4.00	---	5.00	---
LnD:						
Lovelady	4e	4.00	3.00	---	4.00	---
MaE:						
Maben	4e	7.00	---	---	7.00	---
MaG:						
Maben	7e	---	---	---	---	---
Mf:						
Mattex	5w	2.00	2.00	---	---	---

Table 5.--Non-Irrigated Yields by Map Unit Component--Continued

Map symbol and soil name	Land capability	Bahiagrass	Common bermudagrass	Grain sorghum	Improved bermudagrass	Peanuts
		AUM	AUM	Bu	AUM	Lbs
MhC:						
Meth	3e	---	---	---	---	---
Mi:						
Mattex	5w	2.00	2.00	---	---	---
Iulus	2w	8.50	7.00	---	9.00	---
MiQ:						
Pits, mine or quarry, gravelly	6e	---	---	---	4.00	---
MiS:						
Metcalf	2w	7.00	5.00	---	11.00	---
Sawtown	2e	7.00	6.00	---	9.00	---
MpA:						
Mollville	4w	4.00	4.00	---	---	---
Besner	2e	7.00	---	80.00	9.00	---
MsB:						
Moswell	4e	---	4.00	---	5.00	---
MsD:						
Moswell	6e	---	3.00	---	4.00	---
NaB:						
Naclina	4e	5.00	5.00	---	6.00	---
NaD:						
Naclina	6e	3.00	5.00	---	4.00	---
NeB:						
Nacogdoches	3e	---	---	---	8.00	---
NeE:						
Nacogdoches	3e	---	---	---	8.00	---
Ow:						
Owentown	2w	9.00	7.00	---	8.00	---
PeC:						
Penning	2w	6.00	---	---	7.00	---
Kurth	2e	9.00	6.00	---	10.00	---
PoA:						
Pophers	5w	4.00	4.00	---	4.00	---
RaD:						
Rayburn	6e	---	---	---	4.50	---
RkB:						
Raylake	4e	5.00	---	---	6.00	---
RkD:						
Raylake	4e	5.00	---	---	6.00	---

Table 5.--Non-Irrigated Yields by Map Unit Component--Continued

Map symbol and soil name	Land capability	Bahiagrass	Common bermudagrass	Grain sorghum	Improved bermudagrass	Peanuts
		AUM	AUM	Bu	AUM	Lbs
RnB:						
Rentzel	3w	4.00	3.00	---	4.00	---
RsB:						
Rosenwall	4e	---	4.00	---	5.00	---
RsD:						
Rosenwall	6e	---	4.00	---	4.00	---
SaB:						
Sacul	4e	7.50	6.50	70.00	7.50	---
SeB:						
Sawlit	2w	6.00	5.00	---	7.00	---
SfA:						
Sawtown	2e	7.00	6.00	---	9.00	---
SmB:						
Smithdale	3e	9.00	5.50	---	12.00	---
TeD:						
Tehran	6e	5.00	---	---	5.00	---
TnB:						
Tenaha	3s	2.00	2.00	---	3.00	1,400.00
TnD:						
Tenaha	6e	2.00	2.00	---	3.00	---
TnG:						
Tenaha	7e	2.00	2.00	---	3.00	---
TsB:						
Tonkawa	4s	---	---	---	2.00	---
TsD:						
Tonkawa	6e	---	---	---	---	---
Tu:						
Tuscosso	5w	9.00	---	---	---	---
TuD:						
Trawick	6e	3.00	---	---	4.00	---
TuG:						
Trawick	6e	3.00	---	---	4.00	---
WeB:						
Woden	2e	7.00	---	---	9.00	---
W:						
Water	---	---	---	---	---	---

Table 6.--Prime and Other Important Farmland

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map Symbol	Map unit name	Farmland Classification
AaB	Alazan fine sandy loam, 0 to 2 percent slopes	All areas are prime farmland
AbA	Alazan-Besner complex, 0 to 2 percent slopes	All areas are prime farmland
AtA	Alto clay loam, 1 to 3 percent slopes	All areas are prime farmland
AtB	Attoyac fine sandy loam, 0 to 4 percent slopes	All areas are prime farmland
BaB	Bernaldo fine sandy loam, 0 to 3 percent slopes	All areas are prime farmland
BeA	Besner fine sandy loam, 0 to 3 percent slopes	All areas are prime farmland
BoC	Bowie fine sandy loam, 1 to 5 percent slopes	All areas are prime farmland
ChA	Chireno clay loam, 0 to 2 percent slopes	All areas are prime farmland
GaA	Gallime-Alazan complex, 0 to 2 percent slopes	All areas are prime farmland
GaB	Gallime very fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
Hc	Hannahatchee loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
Ia	Iulus fine sandy loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
KuB	Kurth fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
La	Laneville loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
LdB	Latex fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
MhC	Meth fine sandy loam, 1 to 5 percent slopes	All areas are prime farmland
MiS	Metcalf-Sawtown complex, 0 to 2 percent slopes	All areas are prime farmland
NeB	Nacogdoches fine sandy loam, 1 to 5 percent slopes	All areas are prime farmland
NeE	Nacogdoches clay loam, 1 to 5 percent slopes	All areas are prime farmland
Ow	Owentown fine sandy loam, occasionally flooded	All areas are prime farmland
PeC	Penning-Kurth complex, 0 to 2 percent slopes	All areas are prime farmland
SeB	Sawlit fine sandy loam, 0 to 3 percent slopes	All areas are prime farmland
SfA	Sawtown very fine sandy loam, 0 to 2 percent slopes	All areas are prime farmland
SmB	Smithdale sandy loam, 1 to 5 percent slopes	All areas are prime farmland
WeB	Woden fine sandy loam, 0 to 4 percent slopes	All areas are prime farmland
GaC	Gallime-Guyton complex, 0 to 2 percent slopes	Prime farmland, if drained
GtA	Guyton silt loam, 0 to 1 percent slopes	Prime farmland, if drained

Table 7.--Forestland Productivity

Map symbol and soil name	Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
AaB:				
Alazan	loblolly pine	93	350	loblolly pine, slash pine, sweetgum
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	93	260	
AbA:				
Alazan	loblolly pine	93	350	loblolly pine, slash pine, sweetgum
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	93	260	
Besner	loblolly pine	95	380	loblolly pine, slash pine, sweetgum
	shortleaf pine	85	---	
	southern red oak	---	---	
	sweetgum	---	260	
AtA:				
Alto	loblolly pine	90	330	loblolly pine, slash pine
	shortleaf pine	70	---	
	southern red oak	70	---	
	sweetgum	90	260	
AtB:				
Attoyac	loblolly pine	95	380	loblolly pine
	shortleaf pine	87	---	
	sweetgum	---	260	
AuD:				
Austonio	loblolly pine	90	330	loblolly pine
	sweetgum	90	260	
BaB:				
Bernaldo	loblolly pine	95	380	loblolly pine, sweetgum
	shortleaf pine	84	---	
	southern red oak	---	---	
	sweetgum	---	260	
BeA:				
Besner	loblolly pine	95	380	loblolly pine, slash pine, sweetgum
	shortleaf pine	85	---	
	southern red oak	---	---	
	sweetgum	---	260	
BfA:				
Betis	loblolly pine	85	280	loblolly pine
	shortleaf pine	80	---	
BoC:				
Bowie	loblolly pine	90	330	loblolly pine
	shortleaf pine	80	---	
	sweetgum	90	210	
BuB:				
Bub	loblolly pine	65	95	loblolly pine
	shortleaf pine	57	---	
	southern red oak	60	---	

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
ChA:				
Chireno	loblolly pine	75	180	loblolly pine, water oak
	shortleaf pine	65	---	
	sweetgum	75	85	
CoB:				
Corrigan	loblolly pine	87	280	loblolly pine, longleaf pine, shortleaf pine
	longleaf pine	80	---	
	shortleaf pine	70	---	
CrG:				
Cuthbert	loblolly pine	65	95	loblolly pine
	shortleaf pine	---	---	
CtE:				
Cuthbert	loblolly pine	80	230	loblolly pine
	shortleaf pine	72	---	
CtG:				
Cuthbert	loblolly pine	80	230	loblolly pine
	shortleaf pine	75	---	
CtS:				
Cuthbert	loblolly pine	80	230	loblolly pine, shortleaf pine
	shortleaf pine	68	---	
CuE:				
Cuthbert	loblolly pine	80	230	loblolly pine
	shortleaf pine	72	---	
DaC:				
Darco	loblolly pine	85	280	loblolly pine, shortleaf pine
	shortleaf pine	76	---	
DaE:				
Darco	loblolly pine	85	280	loblolly pine, shortleaf pine
	shortleaf pine	76	---	
DsA:				
Dreka	sweetgum	95	260	sweetgum, water oak
	water oak	90	---	
	willow oak	90	---	
EeB:				
Eastwood	hickory	---	---	loblolly pine
	loblolly pine	90	330	
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	---	---	
EeD:				
Eastwood	hickory	---	---	loblolly pine
	loblolly pine	90	330	
	shortleaf pine	77	---	
	southern red oak	---	---	
	sweetgum	---	---	

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
ElA:				
Eastwood	hickory	---	---	loblolly pine
	loblolly pine	90	330	
	shortleaf pine	77	---	
	southern red oak	---	---	
	sweetgum	---	---	
Latex	hickory	---	---	loblolly pine
	loblolly pine	90	330	
	shortleaf pine	86	---	
	slash pine	100	---	
	southern red oak	95	---	
	sweetgum	90	210	
EtB:				
Etoile	loblolly pine	75	180	loblolly pine
	shortleaf pine	66	---	
	sweetgum	75	85	
EtD:				
Etoile	loblolly pine	65	95	loblolly pine
GaA:				
Gallime	loblolly pine	95	380	loblolly pine, sweetgum
	shortleaf pine	80	---	
	southern red oak	---	---	
	sweetgum	---	260	
Alazan	loblolly pine	93	350	loblolly pine, slash pine, sweetgum
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	93	260	
GaB:				
Gallime	loblolly pine	95	380	loblolly pine, sweetgum
	shortleaf pine	80	---	
	southern red oak	---	---	
	sweetgum	---	260	
GaC:				
Gallime	loblolly pine	95	380	loblolly pine, sweetgum
	shortleaf pine	80	---	
	southern red oak	---	---	
	sweetgum	---	260	
Guyton	cherrybark oak	---	---	green ash, loblolly pine, slash pine, water oak
	green ash	---	---	
	loblolly pine	80	230	
	slash pine	90	---	
	sweetgum	80	120	
	water oak	80	---	
	willow oak	78	---	
GrB:				
Grapeland	loblolly pine	85	280	loblolly pine

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
GtA:				
Guyton	cherrybark oak	---	---	green ash, loblolly pine, slash pine, water oak
	green ash	---	---	
	loblolly pine	80	230	
	slash pine	90	---	
	sweetgum	80	120	
	water oak	80	---	
	willow oak	78	---	
GuA:				
Guyton	cherrybark oak	---	---	green ash, loblolly pine, slash pine, water oak
	green ash	---	---	
	loblolly pine	80	230	
	slash pine	90	---	
	sweetgum	80	120	
	water oak	80	---	
	willow oak	78	---	
Sawtown	loblolly pine	95	380	loblolly pine, slash pine
	shortleaf pine	80	---	
	sweetgum	80	260	
HaA:				
Hainesville	loblolly pine	95	380	loblolly pine, shortleaf pine
	longleaf pine	88	---	
	shortleaf pine	75	---	
Hc:				
Hannahatchee	cherrybark oak	---	---	American sycamore, black walnut, loblolly pine, sweetgum
	loblolly pine	100	430	
	sweetgum	100	310	
HeB:				
Herty	loblolly pine	85	280	loblolly pine, slash pine
	post oak	---	---	
	shortleaf pine	70	---	
	southern red oak	70	---	
	water oak	80	---	
Ia:				
Iulus	sweetgum	100	310	loblolly pine, sweetgum
	water oak	100	---	
	loblolly pine	100	430	
Iu:				
Iulus	sweetgum	100	310	loblolly pine, sweetgum
	water oak	100	---	
	loblolly pine	100	430	
KhB:				
Kirvin	loblolly pine	85	280	loblolly pine, shortleaf pine, southern red oak, sweetgum
	shortleaf pine	68	---	
	southern red oak	---	---	
	sweetgum	---	---	

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
KiC:				
Kirvin	loblolly pine	80	230	loblolly pine, slash pine
	shortleaf pine	75	---	
KiD:				
Kirvin	loblolly pine	65	95	loblolly pine
	shortleaf pine	72	---	
KkD:				
Kisatchie	hickory	---	---	loblolly pine
	loblolly pine	65	185	
	post oak	---	---	
	shortleaf pine	55	---	
KuB:				
Kurth	loblolly pine	90	330	loblolly pine, sweetgum, water oak
	shortleaf pine	80	---	
	southern red oak	80	---	
	sweetgum	90	210	
	water oak	80	---	
KwA:				
Kawah	loblolly pine	93	350	loblolly pine
	sweetgum	93	260	
La:				
Laneville	loblolly pine	100	430	loblolly pine
	sweetgum	100	310	
	water oak	100	---	
LaB:				
LaCerda	loblolly pine	85	280	loblolly pine, slash pine
	shortleaf pine	70	---	
	southern red oak	---	---	
	sweetgum	---	---	
LaE:				
LaCerda	loblolly pine	85	280	loblolly pine, slash pine
	shortleaf pine	70	---	
	southern red oak	---	---	
	sweetgum	---	---	
Lb:				
Laneville	loblolly pine	100	430	loblolly pine
	sweetgum	100	210	
	water oak	100	---	
LdB:				
Latex	hickory	---	---	loblolly pine
	loblolly pine	90	330	
	shortleaf pine	86	---	
	slash pine	100	---	
	southern red oak	95	---	
	sweetgum	90	210	

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
LiB:				
Letney	loblolly pine	90	330	loblolly pine, slash pine
	longleaf pine	81	---	
	shortleaf pine	---	---	
LiC:				
Lilbert	loblolly pine	90	330	loblolly pine, slash pine
	longleaf pine	70	---	
	shortleaf pine	74	---	
	southern red oak	---	---	
	sweetgum	---	---	
LiD:				
Letney	loblolly pine	90	330	loblolly pine, slash pine
	longleaf pine	81	---	
	shortleaf pine	---	---	
LnB:				
Lovelady	loblolly pine	90	330	loblolly pine, shortleaf pine, slash pine, sweetgum
	shortleaf pine	80	---	
	southern red oak	80	---	
	sweetgum	90	---	
LnD:				
Lovelady	loblolly pine	90	330	loblolly pine, shortleaf pine, slash pine, sweetgum
	shortleaf pine	80	---	
	southern red oak	80	---	
	sweetgum	90	---	
MaE:				
Maben	loblolly pine	85	280	loblolly pine, shortleaf pine
	shortleaf pine	73	---	
MaG:				
Maben	loblolly pine	80	230	loblolly pine, shortleaf pine
	shortleaf pine	73	---	
Mf:				
Mattex	green ash	90	---	green ash, sweetgum, water oak
	sweetgum	95	260	
	water oak	---	---	
MhC:				
Meth	hickory	---	---	loblolly pine, southern red oak, white oak
	loblolly pine	85	280	
	shortleaf pine	74	---	
	southern red oak	---	---	
	sweetgum	---	---	
	white oak	---	---	
Mi:				
Mattex	green ash	90	---	green ash, sweetgum, water oak
	sweetgum	95	260	
	water oak	---	---	
Iulus	sweetgum	100	310	loblolly pine, sweetgum
	water oak	100	---	
	loblolly pine	100	430	

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
MiQ:				
Pits, mine or quarry, gravelly	---	---	---	---
MiS:				
Metcalf	loblolly pine	90	330	cherrybark oak, loblolly pine, shortleaf pine, Shumard's oak
	shortleaf pine	74	---	
	southern red oak	---	---	
	sweetgum	90	210	
	white oak	---	---	
Sawtown	loblolly pine	95	380	loblolly pine, slash pine
	shortleaf pine	80	---	
	sweetgum	---	260	
MpA:				
Mollville	loblolly pine	80	230	loblolly pine, sweetgum, water oak
	sweetgum	80	120	
	water oak	80	---	
	willow oak	80	---	
Besner	loblolly pine	95	380	loblolly pine, slash pine, sweetgum
	shortleaf pine	85	---	
	southern red oak	---	---	
	sweetgum	---	260	
MsB:				
Moswell	loblolly pine	85	280	loblolly pine
	shortleaf pine	76	---	
	southern red oak	---	---	
	sweetgum	---	---	
MsD:				
Moswell	loblolly pine	85	280	loblolly pine
	shortleaf pine	75	---	
NaB:				
Naclina	loblolly pine	75	180	loblolly pine, shortleaf pine
	shortleaf pine	60	---	
	southern red oak	60	---	
	sweetgum	75	85	
NaD:				
Naclina	loblolly pine	65	95	loblolly pine
	shortleaf pine	60	---	
NeB:				
Nacogdoches	loblolly pine	85	280	loblolly pine, shortleaf pine, southern red oak, sweetgum
	shortleaf pine	68	---	
	southern red oak	---	---	
	sweetgum	---	---	
NeE:				
Nacogdoches	loblolly pine	80	230	loblolly pine, shortleaf pine
	shortleaf pine	60	---	

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
Ow:				
Owentown	blackgum	---	---	black walnut, loblolly pine, pecan, southern red oak, sweetgum
	loblolly pine	100	430	
	southern red oak	---	---	
	sweetgum	---	310	
	white oak	---	---	
PeC:				
Penning	loblolly pine	93	350	loblolly pine
	shortleaf pine	81	---	
	sweetgum	93	260	
Kurth	loblolly pine	90	330	loblolly pine, sweetgum, water oak
	shortleaf pine	80	---	
	southern red oak	80	---	
	sweetgum	90	210	
	water oak	80	---	
PoA:				
Pophers	green ash	---	---	green ash, sweetgum, water oak
	sugarberry	---	---	
	water oak	107	---	
	sweetgum	95	260	
RaD:				
Rayburn	loblolly pine	87	280	loblolly pine, slash pine
	longleaf pine	74	---	
	shortleaf pine	---	---	
RkB:				
Raylake	loblolly pine	85	280	loblolly pine, slash pine
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	---	---	
RkD:				
Raylake	loblolly pine	85	280	loblolly pine, slash pine
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	---	---	
RnB:				
Rentzel	loblolly pine	93	350	loblolly pine
	shortleaf pine	76	---	
	sweetgum	93	260	
RsB:				
Rosenwall	loblolly pine	85	280	loblolly pine, slash pine
	shortleaf pine	68	---	
RsD:				
Rosenwall	loblolly pine	85	280	loblolly pine, slash pine
	shortleaf pine	68	---	
SaB:				
Sacul	loblolly pine	90	330	loblolly pine
	shortleaf pine	---	---	
	sweetgum	90	210	

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
SeB:				
Sawlit	loblolly pine	90	330	loblolly pine
	shortleaf pine	---	---	
	sweetgum	90	210	
SfA:				
Sawtown	loblolly pine	95	380	loblolly pine, slash pine
	shortleaf pine	80	---	
	sweetgum	---	260	
SmB:				
Smithdale	hickory	---	---	loblolly pine
	loblolly pine	90	330	
	post oak	---	---	
	shortleaf pine	75	---	
	southern red oak	---	---	
	sweetgum	90	210	
TeD:				
Tehran	loblolly pine	85	280	loblolly pine, slash pine
	longleaf pine	---	---	
	shortleaf pine	---	---	
TnB:				
Tenaha	loblolly pine	85	280	loblolly pine
	shortleaf pine	77	---	
TnD:				
Tenaha	loblolly pine	85	280	loblolly pine
	shortleaf pine	77	---	
TnG:				
Tenaha	loblolly pine	85	280	loblolly pine
	shortleaf pine	77	---	
TsB:				
Tonkawa	loblolly pine	65	95	loblolly pine
	longleaf pine	---	---	
	shortleaf pine	---	---	
TsD:				
Tonkawa	loblolly pine	65	95	loblolly pine
Tu:				
Tuscosso	loblolly pine	100	430	loblolly pine, southern red oak, water oak
	shortleaf pine	86	---	
	sweetgum	100	310	
	water oak	96	---	
TuD:				
Trawick	loblolly pine	80	230	loblolly pine
	shortleaf pine	70	---	
TuG:				
Trawick	loblolly pine	80	230	loblolly pine
	shortleaf pine	70	---	
	southern red oak	70	---	

Table 7.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber	Trees to manage
			Bd ft/ac	
WeB:				
Woden	loblolly pine	95	380	loblolly pine, slash pine
	shortleaf pine	87	---	
	southern red oak	---	---	
	sweetgum	---	260	
W:				
Water	---	---	---	---

Table 8.--Haul Roads, Log Landings, and Soil Rutting on Forestland

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:							
Alazan	90	Slight		Well suited		Moderate	
						Low strength	0.50
AbA:							
Alazan	45	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Besner	40	Slight		Well suited		Moderate	
						Low strength	0.50
AtA:							
Alto	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
AtB:							
Attoyac	85	Slight		Moderately suited		Severe	
				Low strength	0.50	Low strength	1.00
AuD:							
Austonio	80	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
BaB:							
Bernaldo	90	Moderate		Well suited		Moderate	
		Low strength	0.50			Low strength	0.50
BeA:							
Besner	85	Slight		Well suited		Moderate	
						Low strength	0.50
BfA:							
Betis	95	Slight		Well suited		Moderate	
						Low strength	0.50
BoC:							
Bowie	80	Slight		Well suited		Moderate	
						Low strength	0.50
BuB:							
Bub	80	Moderate		Well suited		Moderate	
		Low strength	0.50			Low strength	0.50
ChA:							
Chireno	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
CoB:							
Corrigan	85	Slight		Moderately suited		Moderate	
				Wetness	0.50	Low strength	0.50

Table 8.--Haul Roads, Log Landings, and Soil Rutting on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
CrG:							
Cuthbert	75	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
CtE:							
Cuthbert	75	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
CtG:							
Cuthbert	85	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
CtS:							
Cuthbert	85	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
CuE:							
Cuthbert	90	Moderate		Moderately suited		Moderate	
		Low strength	0.50	Slope	0.50	Low strength	0.50
DaC:							
Darco	80	Slight		Well suited		Moderate	
						Low strength	0.50
DaE:							
Darco	85	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
DsA:							
Dreka	75	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Wetness	0.50		
				Low strength	0.50		
EeB:							
Eastwood	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
		Stickiness/slope	0.50				
EeD:							
Eastwood	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
ElA:							
Eastwood	50	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Latex	35	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
		Stickiness/slope	0.50				
EtB:							
Etoile	95	Moderate		Moderately suited		Severe	
		Stickiness/slope	0.50	Low strength	0.50	Low strength	1.00
		Low strength	0.50				

Table 8.--Haul Roads, Log Landings, and Soil Rutting on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
EtD:							
Etoile	95	Moderate		Moderately suited		Moderate	
		Low strength	0.50	Slope	0.50	Low strength	0.50
GaA:							
Gallime	47	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Alazan	35	Slight		Well suited		Moderate	
						Low strength	0.50
GaB:							
Gallime	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
GaC:							
Gallime	48	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Guyton	39	Moderate		Poorly suited		Severe	
		Low strength	0.50	Wetness	1.00	Low strength	1.00
				Low strength	0.50		
GrB:							
Grapeland	85	Slight		Well suited		Moderate	
						Low strength	0.50
GtA:							
Guyton	95	Moderate		Poorly suited		Severe	
		Low strength	0.50	Wetness	1.00	Low strength	1.00
				Low strength	0.50		
GuA:							
Guyton	45	Moderate		Poorly suited		Severe	
		Low strength	0.50	Wetness	1.00	Low strength	1.00
				Low strength	0.50		
Sawtown	40	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
HaA:							
Hainesville	85	Slight		Well suited		Moderate	
						Low strength	0.50
Hc:							
Hannahatchee	90	Moderate		Moderately suited		Severe	
		Flooding	0.50	Flooding	0.50	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
HeB:							
Herty	80	Slight		Poorly suited		Severe	
				Wetness	1.00	Low strength	1.00
				Low strength	0.50		

Table 8.--Haul Roads, Log Landings, and Soil Rutting on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
Ia:							
Iulus	90	Moderate		Moderately suited		Severe	
		Flooding	0.50	Flooding	0.50	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
Iu:							
Iulus	90	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
KhB:							
Kirvin	85	Slight		Well suited		Moderate	
						Low strength	0.50
KiC:							
Kirvin	90	Slight		Well suited		Moderate	
						Low strength	0.50
KiD:							
Kirvin	90	Moderate		Well suited		Moderate	
		Low strength	0.50			Low strength	0.50
KkD:							
Kisatchie	90	Moderate		Moderately suited		Moderate	
		Low strength	0.50	Slope	0.50	Low strength	0.50
KuB:							
Kurth	85	Slight		Well suited		Moderate	
						Low strength	0.50
KwA:							
Kawah	90	Moderate		Moderately suited		Moderate	
		Sandiness	0.50	Sandiness	0.50	Low strength	0.50
La:							
Laneville	90	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
LaB:							
LaCerda	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
LaE:							
LaCerda	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
				Stickiness; high plasticity index	0.50		
Lb:							
Laneville	90	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		

Table 8.--Haul Roads, Log Landings, and Soil Rutting on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LdB:							
Latex	87	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
LiB:							
Letney	70	Slight		Well suited		Moderate	
						Low strength	0.50
LiC:							
Lilbert	80	Slight		Well suited		Moderate	
						Low strength	0.50
LiD:							
Letney	70	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
LnB:							
Lovelady	85	Slight		Well suited		Moderate	
						Low strength	0.50
LnD:							
Lovelady	85	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
MaE:							
Maben	90	Moderate		Moderately suited		Moderate	
		Low strength	0.50	Slope	0.50	Low strength	0.50
MaG:							
Maben	90	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
Mf:							
Mattex	75	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
				Wetness	0.50		
MhC:							
Meth	80	Slight		Moderately suited		Severe	
				Low strength	0.50	Low strength	1.00
Mi:							
Mattex	60	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
				Wetness	0.50		
Iulus	30	Moderate		Moderately suited		Severe	
		Flooding	0.50	Flooding	0.50	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	

Table 8.--Haul Roads, Log Landings, and Soil Rutting on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
MiS:							
Metcalf	45	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Sawtown	35	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
		Stickiness/slope	0.50				
MpA:							
Mollville	45	Slight		Poorly suited		Severe	
				Ponding	1.00	Low strength	1.00
				Wetness	1.00		
				Low strength	0.50		
Besner	40	Slight		Well suited		Moderate	
						Low strength	0.50
MsB:							
Moswell	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
MsD:							
Moswell	90	Moderate		Moderately suited		Severe	
		Stickiness/slope	0.50	Slope	0.50	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
NaB:							
Naclina	93	Moderate		Moderately suited		Severe	
		Stickiness/slope	0.50	Low strength	0.50	Low strength	1.00
		Low strength	0.50				
NaD:							
Naclina	93	Moderate		Moderately suited		Severe	
		Stickiness/slope	0.50	Slope	0.50	Low strength	1.00
		Low strength	0.50	Stickiness; high plasticity index	0.50		
				Low strength	0.50		
NeB:							
Nacogdoches	85	Slight		Well suited		Moderate	
						Low strength	0.50
NeE:							
Nacogdoches	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Ow:							
Owentown	80	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
PeC:							
Penning	50	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Kurth	40	Slight		Well suited		Moderate	
						Low strength	0.50

Table 8.--Haul Roads, Log Landings, and Soil Rutting on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PoA:							
Pophers	85	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
				Wetness	0.50		
RaD:							
Rayburn	85	Moderate		Moderately suited		Moderate	
		Low strength	0.50	Slope	0.50	Low strength	0.50
RkB:							
Raylake	85	Moderate		Moderately suited		Severe	
		Stickiness/slope	0.50	Stickiness; high plasticity index	0.50	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
RkD:							
Raylake	95	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
RnB:							
Rentzel	75	Slight		Well suited		Moderate	
						Low strength	0.50
RsB:							
Rosenwall	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
RsD:							
Rosenwall	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
SaB:							
Sacul	85	Slight		Well suited		Moderate	
						Low strength	0.50
SeB:							
Sawlit	80	Slight		Well suited		Moderate	
						Low strength	0.50
SfA:							
Sawtown	85	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
SmB:							
Smithdale	90	Slight		Well suited		Moderate	
						Low strength	0.50
TeD:							
Tehran	86	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
TnB:							
Tenaha	90	Slight		Well suited		Moderate	
						Low strength	0.50

Table 8.--Haul Roads, Log Landings, and Soil Rutting on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TnD:							
Tenaha	85	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
TnG:							
Tenaha	80	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
TsB:							
Tonkawa	85	Moderate		Moderately suited		Moderate	
		Sandiness	0.50	Sandiness	0.50	Low strength	0.50
TsD:							
Tonkawa	85	Moderate		Moderately suited		Moderate	
		Sandiness	0.50	Slope	0.50	Low strength	0.50
				Sandiness	0.50		
Tu:							
Tuscosso	85	Severe		Poorly suited		Severe	
		Flooding	1.00	Flooding	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
TuD:							
Trawick	80	Moderate		Moderately suited		Moderate	
		Low strength	0.50	Slope	0.50	Low strength	0.50
TuG:							
Trawick	80	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
WeB:							
Woden	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
W:							
Water	100	Not rated		Not rated		Not rated	

Table 9.--Hazard of Erosion and Suitability for Roads on Forestland

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
AaB:							
Alazan	90	Slight		Slight		Well suited	
AbA:							
Alazan	45	Slight		Slight		Moderately suited	
						Low strength	0.50
Besner	40	Slight		Slight		Well suited	
AtA:							
Alto	85	Slight		Slight		Moderately suited	
						Low strength	0.50
AtB:							
Attoyac	85	Slight		Slight		Moderately suited	
						Low strength	0.50
AuD:							
Austonio	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
BaB:							
Bernaldo	90	Slight		Slight		Well suited	
BeA:							
Besner	85	Slight		Slight		Well suited	
BfA:							
Betis	95	Slight		Slight		Well suited	
BoC:							
Bowie	80	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
BuB:							
Bub	80	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
ChA:							
Chireno	95	Slight		Slight		Moderately suited	
						Low strength	0.50
CoB:							
Corrigan	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Wetness	0.50
CrG:							
Cuthbert	75	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50

Table 9.--Hazard of Erosion and Suitability for Roads on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
CtE:							
Cuthbert	75	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
CtG:							
Cuthbert	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
CtS:							
Cuthbert	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
CuE:							
Cuthbert	90	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
DaC:							
Darco	80	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
DaE:							
Darco	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
DsA:							
Dreka	75	Slight		Slight		Poorly suited	
						Flooding	1.00
						Wetness	0.50
						Low strength	0.50
EeB:							
Eastwood	95	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
EeD:							
Eastwood	95	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
ElA:							
Eastwood	50	Slight		Slight		Moderately suited	
						Low strength	0.50
Latex	35	Slight		Slight		Moderately suited	
						Low strength	0.50
EtB:							
Etoile	95	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
EtD:							
Etoile	95	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50

Table 9.--Hazard of Erosion and Suitability for Roads on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
GaA:							
Gallime	47	Slight		Slight		Moderately suited	
						Low strength	0.50
Alazan	35	Slight		Slight		Well suited	
GaB:							
Gallime	85	Slight		Slight		Moderately suited	
						Low strength	0.50
GaC:							
Gallime	48	Slight		Slight		Moderately suited	
						Low strength	0.50
Guyton	39	Slight		Slight		Poorly suited	
						Wetness	1.00
						Low strength	0.50
GrB:							
Grapeland	85	Slight		Slight		Well suited	
GtA:							
Guyton	95	Slight		Slight		Poorly suited	
						Wetness	1.00
						Low strength	0.50
GuA:							
Guyton	45	Slight		Slight		Poorly suited	
						Wetness	1.00
						Low strength	0.50
Sawtown	40	Slight		Slight		Moderately suited	
						Low strength	0.50
HaA:							
Hainesville	85	Slight		Slight		Well suited	
Hc:							
Hannahatchee	90	Slight		Slight		Moderately suited	
						Flooding	0.50
						Low strength	0.50
HeB:							
Herty	80	Slight		Slight		Poorly suited	
						Wetness	1.00
						Low strength	0.50
Ia:							
Iulus	90	Slight		Slight		Moderately suited	
						Flooding	0.50
						Low strength	0.50
Iu:							
Iulus	90	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50

Table 9.--Hazard of Erosion and Suitability for Roads on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
KhB:							
Kirvin	85	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
KiC:							
Kirvin	90	Slight		Slight		Well suited	
KiD:							
Kirvin	90	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
KkD:							
Kisatchie	90	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
KuB:							
Kurth	85	Slight		Slight		Well suited	
KwA:							
Kawah	90	Slight		Slight		Moderately suited	
						Sandiness	0.50
La:							
Laneville	90	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
LaB:							
LaCerda	90	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
LaE:							
LaCerda	90	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
						Stickiness; high plasticity index	0.50
Lb:							
Laneville	90	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
LdB:							
Latex	87	Slight		Slight		Moderately suited	
						Low strength	0.50
LiB:							
Letney	70	Slight		Slight		Well suited	
LiC:							
Lilbert	80	Slight		Slight		Well suited	
LiD:							
Letney	70	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50

Table 9.--Hazard of Erosion and Suitability for Roads on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
LnB:							
Lovelady	85	Slight		Slight		Well suited	
LnD:							
Lovelady	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
MaE:							
Maben	90	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
MaG:							
Maben	90	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Mf:							
Mattex	75	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
						Wetness	0.50
MhC:							
Meth	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
Mi:							
Mattex	60	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
						Wetness	0.50
Iulus	30	Slight		Slight		Moderately suited	
						Flooding	0.50
						Low strength	0.50
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	
MiS:							
Metcalf	45	Slight		Slight		Moderately suited	
						Low strength	0.50
Sawtown	35	Slight		Slight		Moderately suited	
						Low strength	0.50
MpA:							
Mollville	45	Slight		Slight		Poorly suited	
						Ponding	1.00
						Wetness	1.00
						Low strength	0.50
Besner	40	Slight		Slight		Well suited	

Table 9.--Hazard of Erosion and Suitability for Roads on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
MsB:							
Moswell	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
MsD:							
Moswell	90	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
NaB:							
Naclina	93	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
NaD:							
Naclina	93	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Stickiness; high plasticity index	0.50
						Low strength	0.50
NeB:							
Nacogdoches	85	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
NeE:							
Nacogdoches	90	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
Ow:							
Owentown	80	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
PeC:							
Penning	50	Slight		Slight		Moderately suited	
						Low strength	0.50
Kurth	40	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
PoA:							
Pophers	85	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
						Wetness	0.50
RaD:							
Rayburn	85	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
RkB:							
Raylake	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Stickiness; high plasticity index	0.50
						Low strength	0.50

Table 9.--Hazard of Erosion and Suitability for Roads on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
RkD:							
Raylake	95	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
RnB:							
Rentzel	75	Slight		Slight		Well suited	
RsB:							
Rosenwall	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
RsD:							
Rosenwall	90	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
SaB:							
Sacul	85	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
SeB:							
Sawlit	80	Slight		Slight		Well suited	
SfA:							
Sawtown	85	Slight		Slight		Moderately suited	
						Low strength	0.50
SmB:							
Smithdale	90	Slight		Moderate		Well suited	
				Slope/erodibility	0.50		
TeD:							
Tehran	86	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
TnB:							
Tenaha	90	Slight		Slight		Well suited	
TnD:							
Tenaha	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
TnG:							
Tenaha	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
TsB:							
Tonkawa	85	Slight		Slight		Moderately suited	
						Sandiness	0.50
TsD:							
Tonkawa	85	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Sandiness	0.50

Table 9.--Hazard of Erosion and Suitability for Roads on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tu:							
Tuscosso------------	85	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
TuD:							
Trawick-------------	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
TuG:							
Trawick-------------	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
WeB:							
Woden---------------	80	Slight		Slight		Moderately suited	
						Low strength	0.50
W:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 10.--Forestland Planting and Harvesting

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
AaB:							
Alazan	90	Well suited		Well suited		Well suited	
AbA:							
Alazan	45	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Besner	40	Well suited		Well suited		Well suited	
AtA:							
Alto	85	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
AtB:							
Attoyac	85	Well suited		Well suited		Moderately suited	
						Low strength	0.50
AuD:							
Austonio	80	Well suited		Moderately suited		Well suited	
				Slope	0.50		
BaB:							
Bernaldo	90	Well suited		Well suited		Well suited	
BeA:							
Besner	85	Well suited		Well suited		Well suited	
BfA:							
Betis	95	Well suited		Well suited		Well suited	
BoC:							
Bowie	80	Well suited		Well suited		Well suited	
BuB:							
Bub	80	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50		
ChA:							
Chireno	95	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
CoB:							
Corrigan	85	Well suited		Well suited		Well suited	
CrG:							
Cuthbert	75	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
				Slope	0.50		

Table 10.--Forestland Planting and Harvesting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
CtE:							
Cuthbert	75	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50		
				Slope	0.50		
CtG:							
Cuthbert	85	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Slope	0.50
				Stickiness; high plasticity index	0.50		
CtS:							
Cuthbert	85	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Slope	0.50
				Stickiness; high plasticity index	0.50		
				Rock fragments	0.50		
CuE:							
Cuthbert	90	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50		
				Slope	0.50		
				Rock fragments	0.50		
DaC:							
Darco	80	Well suited		Moderately suited		Well suited	
				Slope	0.50		
DaE:							
Darco	85	Well suited		Moderately suited		Well suited	
				Slope	0.50		
DsA:							
Dreka	75	Well suited		Well suited		Moderately suited	
						Low strength	0.50
EeB:							
Eastwood	95	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
EeD:							
Eastwood	95	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		

Table 10.--Forestland Planting and Harvesting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
ElA:							
Eastwood	50	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
Latex	35	Well suited		Well suited		Moderately suited	
						Low strength	0.50
EtB:							
Etoile	95	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
EtD:							
Etoile	95	Poorly suited		Poorly suited		Well suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75		
				Slope	0.50		
GaA:							
Gallime	47	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Alazan	35	Well suited		Well suited		Well suited	
GaB:							
Gallime	85	Well suited		Well suited		Moderately suited	
						Low strength	0.50
GaC:							
Gallime	48	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Guyton	39	Well suited		Well suited		Moderately suited	
						Low strength	0.50
GrB:							
Grapeland	85	Well suited		Well suited		Well suited	
GtA:							
Guyton	95	Well suited		Well suited		Moderately suited	
						Low strength	0.50
GuA:							
Guyton	45	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Sawtown	40	Well suited		Well suited		Moderately suited	
						Low strength	0.50
HaA:							
Hainesville	85	Well suited		Well suited		Well suited	

Table 10.--Forestland Planting and Harvesting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
Hc:							
Hannahatchee--------	90	Well suited		Well suited		Moderately suited	
						Low strength	0.50
HeB:							
Herty---------------	80	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
Ia:							
Iulus---------------	90	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Iu:							
Iulus---------------	90	Well suited		Well suited		Moderately suited	
						Low strength	0.50
KhB:							
Kirvin--------------	85	Poorly suited		Poorly suited		Well suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75		
KiC:							
Kirvin--------------	90	Poorly suited		Poorly suited		Well suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75		
				Rock fragments	0.50		
KiD:							
Kirvin--------------	90	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50		
				Slope	0.50		
KkD:							
Kisatchie-----------	90	Poorly suited		Poorly suited		Well suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75		
				Slope	0.50		
KuB:							
Kurth---------------	85	Well suited		Well suited		Well suited	
KwA:							
Kawah---------------	90	Moderately suited		Moderately suited		Moderately suited	
		Sandiness	0.50	Sandiness	0.50	Sandiness	0.50
La:							
Laneville-----------	90	Well suited		Well suited		Moderately suited	
						Low strength	0.50
LaB:							
LaCerda-------------	90	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50

Table 10.--Forestland Planting and Harvesting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
LaE:							
LaCerda	90	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50	Stickiness; high plasticity index	0.50
Lb:							
Laneville	90	Well suited		Well suited		Moderately suited	
						Low strength	0.50
LdB:							
Latex	87	Well suited		Well suited		Moderately suited	
						Low strength	0.50
LiB:							
Letney	70	Well suited		Well suited		Well suited	
LiC:							
Lilbert	80	Well suited		Well suited		Well suited	
LiD:							
Letney	70	Well suited		Moderately suited		Well suited	
				Slope	0.50		
LnB:							
Lovelady	85	Well suited		Well suited		Well suited	
LnD:							
Lovelady	85	Well suited		Moderately suited		Well suited	
				Slope	0.50		
MaE:							
Maben	90	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50		
				Slope	0.50		
MaG:							
Maben	90	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Slope	0.75	Slope	0.50
				Stickiness; high plasticity index	0.75		
Mf:							
Mattex	75	Well suited		Well suited		Moderately suited	
						Low strength	0.50
MhC:							
Meth	80	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50

Table 10.--Forestland Planting and Harvesting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Suitability for hand planting: Value	Suitability for mechanical planting: Rating class and limiting features	Suitability for mechanical planting: Value	Suitability for use of harvesting equipment: Rating class and limiting features	Suitability for use of harvesting equipment: Value
Mi:							
Mattex	60	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Iulus	30	Well suited		Well suited		Moderately suited	
						Low strength	0.50
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	
MiS:							
Metcalf	45	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Sawtown	35	Well suited		Well suited		Moderately suited	
						Low strength	0.50
MpA:							
Mollville	45	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Besner	40	Well suited		Well suited		Well suited	
MsB:							
Moswell	85	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
MsD:							
Moswell	90	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
NaB:							
Naclina	93	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
NaD:							
Naclina	93	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50	Stickiness; high plasticity index	0.50
NeB:							
Nacogdoches	85	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Slope	0.50		
				Stickiness; high plasticity index	0.50		

Table 10.--Forestland Planting and Harvesting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
NeE:							
Nacogdoches	90	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
Ow:							
Owentown	80	Well suited		Well suited		Moderately suited	
						Low strength	0.50
PeC:							
Penning	50	Well suited		Well suited		Moderately suited	
						Low strength	0.50
Kurth	40	Well suited		Well suited		Well suited	
PoA:							
Pophers	85	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
RaD:							
Rayburn	85	Poorly suited		Poorly suited		Well suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75		
				Slope	0.50		
RkB:							
Raylake	85	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
						Stickiness; high plasticity index	0.50
RkD:							
Raylake	95	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
RnB:							
Rentzel	75	Well suited		Well suited		Well suited	
RsB:							
Rosenwall	85	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
RsD:							
Rosenwall	90	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		

Table 10.--Forestland Planting and Harvesting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
SaB:							
Sacul	85	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50		
SeB:							
Sawlit	80	Well suited		Well suited		Well suited	
SfA:							
Sawtown	85	Well suited		Well suited		Moderately suited	
						Low strength	0.50
SmB:							
Smithdale	90	Well suited		Well suited		Well suited	
TeD:							
Tehran	86	Well suited		Moderately suited		Well suited	
				Slope	0.50		
TnB:							
Tenaha	90	Well suited		Well suited		Well suited	
TnD:							
Tenaha	85	Well suited		Moderately suited		Well suited	
				Slope	0.50		
TnG:							
Tenaha	80	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
TsB:							
Tonkawa	85	Moderately suited		Moderately suited		Moderately suited	
		Sandiness	0.50	Sandiness	0.50	Sandiness	0.50
TsD:							
Tonkawa	85	Moderately suited		Moderately suited		Moderately suited	
		Sandiness	0.50	Slope	0.50	Sandiness	0.50
				Sandiness	0.50		
Tu:							
Tuscosso	85	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
TuD:							
Trawick	80	Moderately suited		Moderately suited		Well suited	
		Stickiness; high plasticity index	0.50	Slope	0.50		
				Stickiness; high plasticity index	0.50		

Table 10.--Forestland Planting and Harvesting--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuG:							
Trawick	80	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Slope	0.50
				Stickiness; high plasticity index	0.50		
WeB:							
Woden	80	Well suited		Well suited		Moderately suited	
						Low strength	0.50
W:							
Water	100	Not rated		Not rated		Not rated	

Table 11.--Forestland Site Preparation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
AaB:					
Alazan	90	Well suited		Well suited	
AbA:					
Alazan	45	Well suited		Well suited	
Besner	40	Well suited		Well suited	
AtA:					
Alto	85	Well suited		Well suited	
AtB:					
Attoyac	85	Well suited		Well suited	
AuD:					
Austonio	80	Well suited		Well suited	
BaB:					
Bernaldo	90	Well suited		Well suited	
BeA:					
Besner	85	Well suited		Well suited	
BfA:					
Betis	95	Well suited		Well suited	
BoC:					
Bowie	80	Well suited		Well suited	
BuB:					
Bub	80	Well suited		Well suited	
ChA:					
Chireno	95	Well suited		Well suited	
CoB:					
Corrigan	85	Well suited		Well suited	
CrG:					
Cuthbert	75	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
CtE:					
Cuthbert	75	Well suited		Well suited	
CtG:					
Cuthbert	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
CuE:					
Cuthbert	90	Well suited		Well suited	

Table 11.--Forestland Site Preparation--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
DaC:					
Darco	80	Well suited		Well suited	
DaE:					
Darco	85	Well suited		Well suited	
DsA:					
Dreka	75	Well suited		Well suited	
EeB:					
Eastwood	95	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
EeD:					
Eastwood	95	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
ElA:					
Eastwood	50	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
Latex	35	Well suited		Well suited	
EtB:					
Etoile	95	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
EtD:					
Etoile	95	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
GaA:					
Gallime	47	Well suited		Well suited	
Alazan	35	Well suited		Well suited	
GaB:					
Gallime	85	Well suited		Well suited	
GaC:					
Gallime	48	Well suited		Well suited	
Guyton	39	Well suited		Well suited	
GrB:					
Grapeland	85	Well suited		Well suited	
GtA:					
Guyton	95	Well suited		Well suited	
GuA:					
Guyton	45	Well suited		Well suited	
Sawtown	40	Well suited		Well suited	

Table 11.--Forestland Site Preparation--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
HaA:					
Hainesville	85	Well suited		Well suited	
Hc:					
Hannahatchee	90	Well suited		Well suited	
HeB:					
Herty	80	Well suited		Well suited	
Ia:					
Iulus	90	Well suited		Well suited	
Iu:					
Iulus	90	Well suited		Well suited	
KhB:					
Kirvin	85	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
KiC:					
Kirvin	90	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
KiD:					
Kirvin	90	Well suited		Well suited	
KkD:					
Kisatchie	90	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
KuB:					
Kurth	85	Well suited		Well suited	
KwA:					
Kawah	90	Well suited		Well suited	
La:					
Laneville	94	Well suited		Well suited	
LaB:					
LaCerda	90	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
LaE:					
LaCerda	90	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
Lb:					
Laneville	84	Well suited		Well suited	

Table 11.--Forestland Site Preparation--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
LdB:					
Latex	87	Well suited		Well suited	
LiB:					
Letney	70	Well suited		Well suited	
LiC:					
Lilbert	80	Well suited		Well suited	
LiD:					
Letney	70	Well suited		Well suited	
LnB:					
Lovelady	85	Well suited		Well suited	
LnD:					
Lovelady	85	Well suited		Well suited	
MaE:					
Maben	90	Well suited		Well suited	
MaG:					
Maben	90	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Stickiness; high plasticity index	0.50		
Mf:					
Mattex	75	Well suited		Well suited	
MhC:					
Meth	80	Well suited		Well suited	
Mi:					
Mattex	60	Well suited		Well suited	
Iulus	30	Well suited		Well suited	
MiQ:					
Pits, mine or quarry, gravelly	85	Not rated		Not rated	
MiS:					
Metcalf	45	Well suited		Well suited	
Sawtown	35	Well suited		Well suited	
MpA:					
Mollville	45	Well suited		Well suited	
Besner	40	Well suited		Well suited	
MsB:					
Moswell	85	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		

Table 11.--Forestland Site Preparation--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
MsD:					
Moswell	90	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
NaB:					
Naclina	93	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
NaD:					
Naclina	93	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
NeB:					
Nacogdoches	85	Well suited		Well suited	
NeE:					
Nacogdoches	90	Well suited		Well suited	
Ow:					
Owentown	80	Well suited		Well suited	
PeC:					
Penning	50	Well suited		Well suited	
Kurth	40	Well suited		Well suited	
PoA:					
Pophers	85	Well suited		Well suited	
RaD:					
Rayburn	85	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
RkB:					
Raylake	85	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
RkD:					
Raylake	95	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
RnB:					
Rentzel	75	Well suited		Well suited	
RsD:					
Rosenwall	90	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		

Table 11.--Forestland Site Preparation--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
SaB:					
Sacul	85	Well suited		Well suited	
SeB:					
Sawlit	80	Well suited		Well suited	
SfA:					
Sawtown	85	Well suited		Well suited	
SmB:					
Smithdale	90	Well suited		Well suited	
TeD:					
Tehran	86	Well suited		Well suited	
TnB:					
Tenaha	90	Well suited		Well suited	
TnD:					
Tenaha	85	Well suited		Well suited	
TnG:					
Tenaha	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
TsB:					
Tonkawa	85	Well suited		Well suited	
TsD:					
Tonkawa	85	Well suited		Well suited	
Tu:					
Tuscosso	85	Well suited		Well suited	
TuD:					
Trawick	80	Well suited		Well suited	
TuG:					
Trawick	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
WeB:					
Woden	80	Well suited		Well suited	
W:					
Water	100	Not rated		Not rated	

Table 12.--Damage by Fire and Seedling Mortality on Forestland

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Potential for damage to soil by fire: Value	Potential for seedling mortality: Rating class and limiting features	Potential for seedling mortality: Value
AaB:					
Alazan	90	High		Low	
		Texture/surface depth/rock fragments	1.00		
AbA:					
Alazan	45	Moderate		Low	
		Texture/rock fragments	0.50		
Besner	40	Moderate		Low	
		Texture/rock fragments	0.50		
AtA:					
Alto	85	Low		Low	
AtB:					
Attoyac	85	Moderate		Low	
		Texture/rock fragments	0.50		
AuD:					
Austonio	80	Moderate		Low	
		Texture/rock fragments	0.50		
BaB:					
Bernaldo	90	Moderate		Low	
		Texture/rock fragments	0.50		
BeA:					
Besner	85	Moderate		Low	
		Texture/rock fragments	0.50		
BfA:					
Betis	95	High		Low	
		Texture/rock fragments	1.00		
BoC:					
Bowie	80	Moderate		Low	
		Texture/rock fragments	0.50		
BuB:					
Bub	80	Low		Low	

Table 12.--Damage by Fire and Seedling Mortality on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
ChA:					
Chireno-------------	95	Low		Low	
CoB:					
Corrigan------------	85	Moderate		Low	
		Texture/rock fragments	0.50		
CrG:					
Cuthbert------------	75	Low		Low	
CtE:					
Cuthbert------------	75	Moderate		Low	
		Texture/rock fragments	0.50		
CtG:					
Cuthbert------------	85	Moderate		Moderate	
		Texture/rock fragments	0.50	Available water	0.50
CtS:					
Cuthbert------------	85	High		Moderate	
		Texture/surface depth/rock fragments	1.00	Available water	0.50
CuE:					
Cuthbert------------	90	Moderate		Low	
		Texture/rock fragments	0.50		
DaC:					
Darco---------------	80	High		Low	
		Texture/rock fragments	1.00		
DaE:					
Darco---------------	85	High		Low	
		Texture/rock fragments	1.00		
DsA:					
Dreka---------------	75	Moderate		High	
		Texture/rock fragments	0.50	Wetness	1.00
EeB:					
Eastwood------------	95	Moderate		Low	
		Texture/rock fragments	0.50		
EeD:					
Eastwood------------	95	High		Low	
		Texture/surface depth/rock fragments	1.00		

Table 12.--Damage by Fire and Seedling Mortality on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
ElA:					
Eastwood	50	Moderate		Low	
		Texture/rock fragments	0.50		
Latex	35	Moderate		Low	
		Texture/rock fragments	0.50		
EtB:					
Etoile	95	Moderate		Low	
		Texture/rock fragments	0.50		
EtD:					
Etoile	95	High		Low	
		Texture/surface depth/rock fragments	1.00		
GaA:					
Gallime	47	High		Low	
		Texture/surface depth/rock fragments	1.00		
Alazan	35	High		Low	
		Texture/surface depth/rock fragments	1.00		
GaB:					
Gallime	85	High		Low	
		Texture/surface depth/rock fragments	1.00		
GaC:					
Gallime	48	Moderate		Low	
		Texture/rock fragments	0.50		
Guyton	39	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
				Soil reaction	0.50
GrB:					
Grapeland	85	High		Low	
		Texture/rock fragments	1.00		
GtA:					
Guyton	95	Moderate		High	
		Texture/rock fragments	0.50	Wetness	1.00

Table 12.--Damage by Fire and Seedling Mortality on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
GuA:					
Guyton	45	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Sawtown	40	Moderate		Low	
		Texture/rock fragments	0.50		
HaA:					
Hainesville	85	High		Low	
		Texture/surface depth/rock fragments	1.00		
Hc:					
Hannahatchee	90	High		Low	
		Texture/surface depth/rock fragments	1.00		
HeB:					
Herty	80	High		High	
		Texture/surface depth/rock fragments	1.00	Wetness	1.00
Ia:					
Iulus	90	Moderate		Low	
		Texture/rock fragments	0.50		
Iu:					
Iulus	90	Moderate		Low	
		Texture/rock fragments	0.50		
KhB:					
Kirvin	85	Moderate		High	
		Texture/surface depth/rock fragments	0.50	Available water	1.00
KiC:					
Kirvin	90	Moderate		Low	
		Texture/rock fragments	0.50		
KiD:					
Kirvin	90	High		Moderate	
		Texture/surface depth/rock fragments	1.00	Soil reaction	0.50

Table 12.--Damage by Fire and Seedling Mortality on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
KkD:					
Kisatchie	90	High		Moderate	
		Texture/surface depth/rock fragments	1.00	Soil reaction	0.50
KuB:					
Kurth	85	Moderate		Low	
		Texture/rock fragments	0.50		
KwA:					
Kawah	90	High		Low	
		Texture/rock fragments	1.00		
La:					
Laneville	90	Low		Low	
		Texture/rock fragments	0.10		
LaB:					
LaCerda	90	Low		Low	
LaE:					
LaCerda	90	Low		Low	
Lb:					
Laneville	90	Low		Low	
		Texture/rock fragments	0.10		
LdB:					
Latex	87	Moderate		Low	
		Texture/rock fragments	0.50		
LiB:					
Letney	70	High		Low	
		Texture/surface depth/rock fragments	1.00		
LiC:					
Lilbert	80	High		Low	
		Texture/surface depth/rock fragments	1.00		
LiD:					
Letney	70	High		Low	
		Texture/rock fragments	1.00		

Table 12.--Damage by Fire and Seedling Mortality on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
LnB:					
Lovelady	85	High		Low	
		Texture/rock fragments	1.00		
LnD:					
Lovelady	85	High		Low	
		Texture/surface depth/rock fragments	1.00		
MaE:					
Maben	90	High		Low	
		Texture/surface depth/rock fragments	1.00		
MaG:					
Maben	90	High		Moderate	
		Texture/surface depth/rock fragments	1.00	Available water	0.50
Mf:					
Mattex	75	Low		High	
				Wetness	1.00
MhC:					
Meth	80	High		Low	
		Texture/surface depth/rock fragments	1.00		
Mi:					
Mattex	60	Moderate		High	
		Texture/surface depth/rock fragments	0.50	Wetness	1.00
Iulus	30	High		Low	
		Texture/surface depth/rock fragments	1.00		
MiQ:					
Pits, mine or quarry, gravelly	85	Not rated		Not rated	
MiS:					
Metcalf	45	Moderate		Low	
		Texture/rock fragments	0.50		
Sawtown	35	Moderate		Low	
		Texture/rock fragments	0.50		

Table 12.--Damage by Fire and Seedling Mortality on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MpA:					
Mollville	45	Moderate		High	
		Texture/rock fragments	0.50	Wetness	1.00
Besner	40	Moderate		Low	
		Texture/rock fragments	0.50		
MsB:					
Moswell	85	Moderate		Low	
		Texture/rock fragments	0.50		
MsD:					
Moswell	90	Moderate		Low	
		Texture/rock fragments	0.50		
NaB:					
Naclina	93	Low		Low	
NaD:					
Naclina	93	High		Low	
		Texture/surface depth/rock fragments	1.00		
NeB:					
Nacogdoches	85	Moderate		Low	
		Texture/rock fragments	0.50		
NeE:					
Nacogdoches	90	Low		Low	
Ow:					
Owentown	80	High		Low	
		Texture/surface depth/rock fragments	1.00		
PeC:					
Penning	50	High		Low	
		Texture/surface depth/rock fragments	1.00		
Kurth	40	Moderate		Low	
		Texture/rock fragments	0.50		
PoA:					
Pophers	85	High		High	
		Texture/surface depth/rock fragments	1.00	Wetness	1.00

Table 12.--Damage by Fire and Seedling Mortality on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
RaD:					
Rayburn	85	Moderate		Low	
		Texture/rock fragments	0.50		
RkB:					
Raylake	85	High		Low	
		Texture/rock fragments	1.00		
RkD:					
Raylake	95	Low		Moderate	
				Soil reaction	0.50
RnB:					
Rentzel	75	High		Low	
		Texture/surface depth/rock fragments	1.00		
RsB:					
Rosenwall	85	High		Low	
		Texture/surface depth/rock fragments	1.00		
RsD:					
Rosenwall	90	Moderate		Low	
		Texture/rock fragments	0.50		
SaB:					
Sacul	85	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
SeB:					
Sawlit	80	Moderate		Low	
		Texture/rock fragments	0.50		
SfA:					
Sawtown	85	High		Low	
		Texture/surface depth/rock fragments	1.00		
SmB:					
Smithdale	90	Moderate		Low	
		Texture/rock fragments	0.50		
TeD:					
Tehran	86	High		Low	
		Texture/rock fragments	1.00		

Table 12.--Damage by Fire and Seedling Mortality on Forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
TnB:					
Tenaha	90	High		Low	
		Texture/surface depth/rock fragments	1.00		
TnD:					
Tenaha	85	High		Low	
		Texture/surface depth/rock fragments	1.00		
TnG:					
Tenaha	80	High		Moderate	
		Texture/surface depth/rock fragments	1.00	Available water	0.50
TsB:					
Tonkawa	85	High		Low	
		Texture/rock fragments	1.00		
TsD:					
Tonkawa	85	High		Low	
		Texture/rock fragments	1.00		
Tu:					
Tuscosso	85	Moderate		Low	
		Texture/rock fragments	0.50		
TuD:					
Trawick	80	Low		Low	
TuG:					
Trawick	80	Low		Moderate	
				Available water	0.50
WeB:					
Woden	80	Moderate		Low	
		Texture/rock fragments	0.50		
W:					
Water	100	Not rated		Not rated	

Table 13.--Camp Areas, Picnic Areas, and Playgrounds

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:							
Alazan	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
AbA:							
Alazan	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
Besner	40	Not limited		Not limited		Not limited	
AtA:							
Alto	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
AtB:							
Attoyac	85	Not limited		Not limited		Not limited	
AuD:							
Austonio	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
BaB:							
Bernaldo	90	Not limited		Not limited		Not limited	
BeA:							
Besner	85	Not limited		Not limited		Not limited	
BfA:							
Betis	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.96	Too sandy	0.96	Too sandy	0.96
						Slope	0.50
BoC:							
Bowie	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
						Slope	0.12
BuB:							
Bub	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slope	0.28
						Slow water movement	0.26
ChA:							
Chireno	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
CoB:							
Corrigan	85	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone	0.81	Depth to saturated zone	0.48	Depth to saturated zone	0.81
						Depth to bedrock	0.29
						Slope	0.12
CrG:							
Cuthbert	75	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	1.00
		Slope	0.16	Slope	0.16	Gravel	1.00
		Gravel	0.01	Gravel	0.01	Slow water movement	0.26
CtE:							
Cuthbert	75	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	1.00
		Slope	0.16	Slope	0.16	Slow water movement	0.26
						Gravel	0.01
CtG:							
Cuthbert	85	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
						Gravel	0.01
CtS:							
Cuthbert	85	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.50	Slow water movement	0.50	Slow water movement	0.50
CuE:							
Cuthbert	90	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	1.00
		Gravel	0.24	Gravel	0.24	Gravel	1.00
		Slope	0.16	Slope	0.16	Slow water movement	0.26
DaC:							
Darco	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Slope	0.88
						Too sandy	0.85
DaE:							
Darco	85	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.85	Too sandy	0.85	Slope	1.00
		Slope	0.63	Slope	0.63	Too sandy	0.85

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
DsA:							
Dreka	75	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.75	Flooding	1.00
		Depth to saturated zone	0.98	Flooding	0.40	Depth to saturated zone	0.98
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
EeB:							
Eastwood	95	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
						Slope	0.12
EeD:							
Eastwood	95	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
ElA:							
Eastwood	50	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
Latex	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
EtB:							
Etoile	95	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
						Slope	0.12
EtD:							
Etoile	95	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
GaA:							
Gallime	47	Not limited		Not limited		Not limited	
Alazan	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
GaB:							
Gallime	85	Not limited		Not limited		Not limited	

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GaC:							
Gallime	48	Not limited		Not limited		Not limited	
Guyton	39	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
GrB:							
Grapeland	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.34	Too sandy	0.34	Too sandy	0.34
						Slope	0.12
GtA:							
Guyton	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
GuA:							
Guyton	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
Sawtown	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.01	Too sandy	0.01	Too sandy	0.01
HaA:							
Hainesville	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.83	Too sandy	0.83	Too sandy	0.83
Hc:							
Hannahatchee	90	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
HeB:							
Herty	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
Ia:							
Iulus	90	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
Iu:							
Iulus	90	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
KhB:							
Kirvin	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
						Slope	0.12
KiC:							
Kirvin	90	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.26	Slow water movement	0.26	Gravel	1.00
		Gravel	0.24	Gravel	0.24	Slow water movement	0.26
						Slope	0.12
KiD:							
Kirvin	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	0.88
						Slow water movement	0.26
KkD:							
Kisatchie	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
						Depth to bedrock	0.90
KuB:							
Kurth	85	Not limited		Not limited		Not limited	
KwA:							
Kawah	90	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	0.03	Depth to saturated zone	0.07
La:							
Laneville	90	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Slow water movement	0.26	Flooding	0.60
		Slow water movement	0.26	Depth to saturated zone	0.03	Slow water movement	0.26
		Depth to saturated zone	0.07			Depth to saturated zone	0.07
LaB:							
LaCerda	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
						Slope	0.12
LaE:							
LaCerda	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.16	Slope	0.16	Slope	1.00

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lb:							
Laneville	90	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Slow water movement	0.94	Flooding	1.00
		Slow water movement	0.94	Flooding	0.40	Slow water movement	0.94
		Depth to saturated zone	0.07	Depth to saturated zone	0.03	Depth to saturated zone	0.07
LdB:							
Latex	87	Not limited		Not limited		Not limited	
LiB:							
Letney	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.42	Too sandy	0.42	Too sandy	0.42
						Slope	0.12
LiC:							
Lilbert	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Too sandy	0.85
						Slope	0.12
LiD:							
Letney	70	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.42	Too sandy	0.42	Slope	1.00
		Slope	0.16	Slope	0.16	Too sandy	0.42
LnB:							
Lovelady	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.37	Too sandy	0.37	Too sandy	0.37
						Slope	0.12
LnD:							
Lovelady	85	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.37	Too sandy	0.37	Slope	1.00
						Too sandy	0.37
MaE:							
Maben	90	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	1.00
		Slope	0.16	Slope	0.16	Slow water movement	0.26
MaG:							
Maben	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
Mf:							
Mattex	75	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Slow water movement	0.94	Flooding	1.00
		Slow water movement	0.94	Depth to saturated zone	0.48	Slow water movement	0.94
		Depth to saturated zone	0.81	Flooding	0.40	Depth to saturated zone	0.81
MhC:							
Meth	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
						Slope	0.12
Mi:							
Mattex	60	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Slow water movement	0.94	Flooding	1.00
		Slow water movement	0.94	Depth to saturated zone	0.48	Slow water movement	0.94
		Depth to saturated zone	0.81	Flooding	0.40	Depth to saturated zone	0.81
Iulus	30	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	
MiS:							
Metcalf	45	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
Sawtown	35	Not limited		Not limited		Not limited	
MpA:							
Mollville	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
Besner	40	Not limited		Not limited		Not limited	
MsB:							
Moswell	85	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
						Slope	0.12

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MsD:							
Moswell	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
NaB:							
Naclina	93	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
						Slope	0.12
NaD:							
Naclina	93	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too clayey	1.00	Too clayey	1.00	Slope	1.00
		Slope	0.16	Slope	0.16	Too clayey	1.00
NeB:							
Nacogdoches	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	0.88
						Slow water movement	0.26
NeE:							
Nacogdoches	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
						Slope	0.12
Ow:							
Owentown	80	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
PeC:							
Penning	50	Not limited		Not limited		Not limited	
Kurth	40	Not limited		Not limited		Somewhat limited	
						Slope	0.12
PoA:							
Pophers	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.75	Flooding	1.00
		Depth to saturated zone	0.98	Flooding	0.40	Depth to saturated zone	0.98
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
RaD:							
Rayburn	85	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.16	Slope	0.16	Slope	1.00

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RkB:							
Raylake	85	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
						Slope	0.12
RkD:							
Raylake	95	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
RnB:							
Rentzel	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.92	Too sandy	0.92	Too sandy	0.92
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
		Depth to saturated zone	0.07	Depth to saturated zone	0.03	Slope	0.12
						Depth to saturated zone	0.07
RsB:							
Rosenwall	85	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
						Depth to bedrock	0.71
						Slope	0.12
RsD:							
Rosenwall	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
						Depth to bedrock	0.71
SaB:							
Sacul	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
						Slope	0.12
						Gravel	0.06
SeB:							
Sawlit	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.01	Too sandy	0.01	Too sandy	0.01
SfA:							
Sawtown	85	Not limited		Not limited		Not limited	
SmB:							
Smithdale	90	Not limited		Not limited		Somewhat limited	
						Slope	0.12
						Gravel	0.01

Table 13.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
TeD:							
Tehran	86	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.42	Too sandy	0.42	Slope	1.00
		Slope	0.16	Slope	0.16	Too sandy	0.42
TnB:							
Tenaha	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Too sandy	0.85
						Slope	0.12
TnD:							
Tenaha	85	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.85	Too sandy	0.85	Slope	1.00
		Slope	0.16	Slope	0.16	Too sandy	0.85
						Slope	0.50
TnG:							
Tenaha	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Too sandy	0.85	Too sandy	0.85	Too sandy	0.85
TsB:							
Tonkawa	85	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
TsD:							
Tonkawa	85	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Too sandy	1.00
Tu:							
Tuscosso	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
TuD:							
Trawick	80	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.26	Slow water movement	0.26	Slope	1.00
		Slope	0.16	Slope	0.16	Gravel	1.00
		Gravel	0.01	Gravel	0.01	Slow water movement	0.26
TuG:							
Trawick	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
WeB:							
Woden	80	Not limited		Not limited		Not limited	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 14.--Paths, Trails, and Golf Course Fairways

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Paths and trails: Value	Off-road motorcycle trails: Rating class and limiting features	Off-road motorcycle trails: Value	Golf course fairways: Rating class and limiting features	Golf course fairways: Value
AaB:							
Alazan	90	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
AbA:							
Alazan	45	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
Besner	40	Not limited		Not limited		Not limited	
AtA:							
Alto	85	Not limited		Not limited		Not limited	
AtB:							
Attoyac	85	Not limited		Not limited		Not limited	
AuD:							
Austonio	80	Not limited		Not limited		Somewhat limited	
						Slope	0.16
BaB:							
Bernaldo	90	Not limited		Not limited		Not limited	
BeA:							
Besner	85	Not limited		Not limited		Not limited	
BfA:							
Betis	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.96	Too sandy	0.96	Droughty	0.18
BoC:							
Bowie	80	Not limited		Not limited		Not limited	
BuB:							
Bub	80	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.98
ChA:							
Chireno	95	Not limited		Not limited		Not limited	
CoB:							
Corrigan	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.11	Depth to saturated zone	0.11	Depth to saturated zone	0.48
						Depth to bedrock	0.29

Table 14.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf course fairways: Rating class and limiting features	Value
CrG:							
Cuthbert	75	Not limited		Not limited		Somewhat limited	
						Slope	0.16
						Gravel	0.01
CtE:							
Cuthbert	75	Not limited		Not limited		Somewhat limited	
						Slope	0.16
CtG:							
Cuthbert	85	Very limited		Not limited		Very limited	
		Slope	1.00			Too steep	1.00
CtS:							
Cuthbert	85	Very limited		Not limited		Very limited	
		Slope	1.00			Too steep	1.00
CuE:							
Cuthbert	90	Not limited		Not limited		Somewhat limited	
						Gravel	0.24
						Slope	0.16
DaC:							
Darco	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Droughty	0.34
DaE:							
Darco	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Slope	0.63
						Droughty	0.34
DsA:							
Dreka	75	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	0.75
EeB:							
Eastwood	95	Not limited		Not limited		Not limited	
EeD:							
Eastwood	95	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.16
ElA:							
Eastwood	50	Not limited		Not limited		Not limited	
Latex	35	Not limited		Not limited		Not limited	
EtB:							
Etoile	95	Not limited		Not limited		Not limited	
EtD:							
Etoile	95	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.16

Table 14.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf course fairways: Rating class and limiting features	Value
GaA:							
Gallime	47	Not limited		Not limited		Not limited	
Alazan	35	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
GaB:							
Gallime	85	Not limited		Not limited		Not limited	
GaC:							
Gallime	48	Not limited		Not limited		Not limited	
Guyton	39	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GrB:							
Grapeland	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.34	Too sandy	0.34	Droughty	0.12
GtA:							
Guyton	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GuA:							
Guyton	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Sawtown	40	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.01	Too sandy	0.01		
HaA:							
Hainesville	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.83	Too sandy	0.83		
Hc:							
Hannahatchee	90	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
HeB:							
Herty	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ia:							
Iulus	90	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
Iu:							
Iulus	90	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00

Table 14.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf course fairways: Rating class and limiting features	Value
KhB:							
Kirvin	85	Not limited		Not limited		Not limited	
KiC:							
Kirvin	90	Not limited		Not limited		Somewhat limited	
						Gravel	0.24
KiD:							
Kirvin	90	Not limited		Not limited		Not limited	
KkD:							
Kisatchie	90	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.90
						Slope	0.16
						Droughty	0.11
KuB:							
Kurth	85	Not limited		Not limited		Not limited	
KwA:							
Kawah	90	Very limited		Very limited		Somewhat limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	0.92
						Depth to saturated zone	0.03
La:							
Laneville	90	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.03
LaB:							
LaCerda	90	Not limited		Not limited		Not limited	
LaE:							
LaCerda	90	Not limited		Not limited		Somewhat limited	
						Slope	0.16
Lb:							
Laneville	90	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
						Depth to saturated zone	0.03
LdB:							
Latex	87	Not limited		Not limited		Not limited	
LiB:							
Letney	70	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.42	Too sandy	0.42		
LiC:							
Lilbert	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Droughty	0.21

Table 14.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Paths and trails: Value	Off-road motorcycle trails: Rating class and limiting features	Off-road motorcycle trails: Value	Golf course fairways: Rating class and limiting features	Golf course fairways: Value
LiD:							
Letney	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.42	Too sandy	0.42	Slope	0.16
						Droughty	0.03
LnB:							
Lovelady	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.37	Too sandy	0.37	Droughty	0.10
LnD:							
Lovelady	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.37	Too sandy	0.37	Droughty	0.29
MaE:							
Maben	90	Not limited		Not limited		Somewhat limited	
						Slope	0.16
MaG:							
Maben	90	Very limited		Not limited		Very limited	
		Slope	1.00			Too steep	1.00
Mf:							
Mattex	75	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
		Depth to saturated zone	0.11	Depth to saturated zone	0.11	Depth to saturated zone	0.48
MhC:							
Meth	80	Not limited		Not limited		Not limited	
Mi:							
Mattex	60	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
		Depth to saturated zone	0.11	Depth to saturated zone	0.11	Depth to saturated zone	0.48
Iulus	30	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	
MiS:							
Metcalf	45	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
Sawtown	35	Not limited		Not limited		Not limited	

Table 14.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MpA:							
Mollville-----------	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
Besner--------------	40	Not limited		Not limited		Not limited	
MsB:							
Moswell-------------	85	Not limited		Not limited		Not limited	
MsD:							
Moswell-------------	90	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.16
NaB:							
Naclina-------------	93	Not limited		Not limited		Not limited	
NaD:							
Naclina-------------	93	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
						Slope	0.16
NeB:							
Nacogdoches---------	85	Not limited		Not limited		Not limited	
NeE:							
Nacogdoches---------	90	Not limited		Not limited		Not limited	
Ow:							
Owentown------------	80	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
PeC:							
Penning-------------	50	Not limited		Not limited		Not limited	
Kurth---------------	40	Not limited		Not limited		Not limited	
PoA:							
Pophers-------------	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	0.75
RaD:							
Rayburn-------------	85	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.16
RkB:							
Raylake-------------	85	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00

Table 14.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Paths and trails: Value	Off-road motorcycle trails: Rating class and limiting features	Off-road motorcycle trails: Value	Golf course fairways: Rating class and limiting features	Golf course fairways: Value
RkD:							
Raylake	95	Not limited		Not limited		Somewhat limited	
						Slope	0.16
RnB:							
Rentzel	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.92	Too sandy	0.92	Droughty	0.14
						Depth to saturated zone	0.03
RsB:							
Rosenwall	85	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.71
						Droughty	0.41
RsD:							
Rosenwall	90	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.71
						Droughty	0.39
						Slope	0.16
SaB:							
Sacul	85	Not limited		Not limited		Somewhat limited	
						Droughty	0.01
SeB:							
Sawlit	80	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.01	Too sandy	0.01		
SfA:							
Sawtown	85	Not limited		Not limited		Not limited	
SmB:							
Smithdale	90	Not limited		Not limited		Not limited	
TeD:							
Tehran	86	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.42	Too sandy	0.42	Droughty	0.34
						Slope	0.16
TnB:							
Tenaha	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Droughty	0.01
TnD:							
Tenaha	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Slope	0.16
						Droughty	0.01
TnG:							
Tenaha	80	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Too sandy	0.85	Too steep	1.00
		Too sandy	0.85				

Table 14.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TsB:							
Tonkawa	85	Very limited		Very limited		Somewhat limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	0.92
TsD:							
Tonkawa	85	Very limited		Very limited		Somewhat limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	0.92
						Slope	0.63
Tu:							
Tuscosso	85	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
TuD:							
Trawick	80	Not limited		Not limited		Somewhat limited	
						Slope	0.16
						Gravel	0.01
TuG:							
Trawick	80	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Too steep	1.00
WeB:							
Woden	80	Not limited		Not limited		Not limited	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
AaB:							
Alazan	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75	Depth to saturated zone	0.75
AbA:							
Alazan	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75	Depth to saturated zone	0.75
		Droughty	0.01			Droughty	0.01
Besner	40	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.03			Droughty	0.03
AtA:							
Alto	85	Not limited		Not limited		Not limited	
AtB:							
Attoyac	85	Not limited		Not limited		Not limited	
AuD:							
Austonio	80	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.16			Slope	1.00
						Droughty	0.16
BaB:							
Bernaldo	90	Not limited		Not limited		Not limited	
BeA:							
Besner	85	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.03			Droughty	0.03
BfA:							
Betis	95	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Droughty	0.16		
BoC:							
Bowie	80	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.32			Droughty	0.32
BuB:							
Bub	80	Very limited		Very limited		Very limited	
		Droughty	1.00	Bedrock	1.00	Droughty	1.00
		Bedrock	1.00	Droughty	0.98	Bedrock	1.00
		Too clayey	0.19	Too clayey	0.19	Too clayey	0.19

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
ChA:							
Chireno-------------	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.10	Too clayey	0.05	Droughty	0.10
		Too clayey	0.05			Too clayey	0.05
CoB:							
Corrigan------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.94	Depth to saturated zone	0.94	Depth to saturated zone	0.94
		Droughty	0.84	Percs slowly	0.50	Droughty	0.84
		Percs slowly	0.50	Bedrock	0.29	Percs slowly	0.50
		Bedrock	0.29			Bedrock	0.29
CrG:							
Cuthbert------------	75	Somewhat limited		Somewhat limited		Very limited	
		Droughty	0.67	Too clayey	0.19	Slope	1.00
		Too clayey	0.19	Too gravelly, cobbly, or stony	0.07	Droughty	0.67
		Too gravelly, cobbly, or stony	0.07			Too clayey	0.19
						Too gravelly, cobbly, or stony	0.07
CtE:							
Cuthbert------------	75	Somewhat limited		Not limited		Very limited	
		Droughty	0.55			Slope	1.00
						Droughty	0.55
CtG:							
Cuthbert------------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.78	Slope	0.78	Slope	1.00
		Droughty	0.62			Droughty	0.62
CtS:							
Cuthbert------------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.78	Slope	0.78	Slope	1.00
		Droughty	0.61			Droughty	0.61
CuE:							
Cuthbert------------	90	Somewhat limited		Somewhat limited		Very limited	
		Droughty	0.69	Too gravelly, cobbly, or stony	0.51	Slope	1.00
		Too gravelly, cobbly, or stony	0.51			Droughty	0.69
						Too gravelly, cobbly, or stony	0.51
DaC:							
Darco---------------	80	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Droughty	0.32	Slope	0.12
DaE:							
Darco---------------	85	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Slope	1.00
		Too sandy	0.50	Droughty	0.32	Droughty	1.00

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DsA:							
Dreka	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99	Depth to saturated zone	0.99
EeB:							
Eastwood	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Droughty	0.02			Droughty	0.02
EeD:							
Eastwood	95	Somewhat limited		Somewhat limited		Very limited	
		Percs slowly	0.50	Percs slowly	0.50	Slope	1.00
		Droughty	0.01			Percs slowly	0.50
						Droughty	0.01
ElA:							
Eastwood	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
Latex	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
		Droughty	0.01			Droughty	0.01
EtB:							
Etoile	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
EtD:							
Etoile	95	Somewhat limited		Somewhat limited		Very limited	
		Percs slowly	0.50	Percs slowly	0.50	Slope	1.00
						Percs slowly	0.50
GaA:							
Gallime	47	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.01			Droughty	0.01
Alazan	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75	Depth to saturated zone	0.75
		Droughty	0.01			Droughty	0.01
GaB:							
Gallime	85	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.01			Droughty	0.01
GaC:							
Gallime	48	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.08			Droughty	0.08
Guyton	39	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GrB:							
Grapeland-----------	85	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Droughty	0.11		
GtA:							
Guyton--------------	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
GuA:							
Guyton--------------	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
Sawtown-------------	40	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.08			Droughty	0.08
HaA:							
Hainesville---------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.99	Too sandy	0.50	Droughty	0.99
		Too sandy	0.50				
Hc:							
Hannahatchee--------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.50	Flooding	0.50	Flooding	0.50
		Droughty	0.01			Droughty	0.01
HeB:							
Herty---------------	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
				Excess sodium	0.32		
Ia:							
Iulus---------------	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.50	Flooding	0.50	Flooding	0.50
		Depth to saturated zone	0.04	Depth to saturated zone	0.04	Depth to saturated zone	0.04
Iu:							
Iulus---------------	70	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.50	Flooding	0.50	Flooding	1.00
		Depth to saturated zone	0.04	Depth to saturated zone	0.04	Depth to saturated zone	0.04
		Droughty	0.01			Droughty	0.01
KhB:							
Kirvin--------------	85	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.32			Droughty	0.32

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
KiC:							
Kirvin	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.58	Too gravelly, cobbly, or stony	0.51	Droughty	0.58
		Too gravelly, cobbly, or stony	0.51			Too gravelly, cobbly, or stony	0.51
KiD:							
Kirvin	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.23	Too clayey	0.01	Droughty	0.23
		Too clayey	0.01			Slope	0.12
						Too clayey	0.01
KkD:							
Kisatchie	90	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Bedrock	0.90	Droughty	1.00
		Bedrock	0.90	Percs slowly	0.50	Slope	1.00
		Percs slowly	0.50	Droughty	0.10	Bedrock	0.90
						Percs slowly	0.50
KuB:							
Kurth	80	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.22			Droughty	0.22
KwA:							
Kawah	90	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Droughty	0.92	Droughty	1.00
		Too sandy	1.00	Too sandy	0.50	Too sandy	0.50
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.44
La:							
Laneville	94	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.50	Flooding	0.50	Flooding	0.50
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.44
		Droughty	0.01			Droughty	0.01
LaB:							
LaCerda	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.70	Too clayey	0.70	Too clayey	0.70
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Droughty	0.05			Droughty	0.05
LaE:							
LaCerda	90	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.70	Too clayey	0.70	Slope	1.00
		Percs slowly	0.50	Percs slowly	0.50	Too clayey	0.70
		Droughty	0.06			Percs slowly	0.50
						Droughty	0.06

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
Lb:							
Laneville-----------	84	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.50	Flooding	0.50	Flooding	1.00
		Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.44
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
		Droughty	0.03			Droughty	0.03
LdB:							
Latex---------------	87	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.01			Droughty	0.01
LiB:							
Letney--------------	70	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.96	Too sandy	0.50	Droughty	0.96
		Too sandy	0.50			Too sandy	0.50
LiC:							
Lilbert-------------	80	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Droughty	0.19		
LiD:							
Letney--------------	70	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Droughty	0.02	Slope	1.00
						Too sandy	0.50
LnB:							
Lovelady------------	85	Very limited		Very limited		Very limited	
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Too sandy	0.50	Potentially or highly erodible	1.00
		Droughty	1.00	Droughty	0.09	Droughty	1.00
		Too sandy	0.50				
LnD:							
Lovelady------------	85	Very limited		Very limited		Very limited	
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Too sandy	0.50	Potentially or highly erodible	1.00
		Droughty	1.00	Droughty	0.27	Droughty	1.00
		Too sandy	0.50			Slope	0.88
MaE:							
Maben---------------	90	Not limited		Not limited		Very limited	
						Slope	1.00

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
MaG:							
Maben	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.78	Slope	0.78	Slope	1.00
		Droughty	0.68			Droughty	0.68
Mf:							
Mattex	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.94	Depth to saturated zone	0.94	Depth to saturated zone	0.94
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
		Droughty	0.06			Droughty	0.06
MhC:							
Meth	80	Not limited		Not limited		Not limited	
Mi:							
Mattex	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.94	Depth to saturated zone	0.94	Depth to saturated zone	0.94
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
		Droughty	0.06			Droughty	0.06
Iulus	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.50	Flooding	0.50	Flooding	0.50
		Depth to saturated zone	0.04	Depth to saturated zone	0.04	Depth to saturated zone	0.04
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	
MiS:							
Metcalf	45	Very limited		Very limited		Very limited	
		Percs slowly	1.00	Potentially or highly erodible	1.00	Percs slowly	1.00
		Potentially or highly erodible	1.00	Percs slowly	1.00	Potentially or highly erodible	1.00
		Depth to saturated zone	0.75	Depth to saturated zone	0.75	Depth to saturated zone	0.75
Sawtown	35	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.08			Droughty	0.08
MpA:							
Mollville	45	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
Besner	40	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.02			Droughty	0.02

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
MsB:							
Moswell	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Excess salt	0.12	Excess salt	0.12	Excess salt	0.12
MsD:							
Moswell	90	Somewhat limited		Somewhat limited		Very limited	
		Percs slowly	0.50	Percs slowly	0.50	Slope	1.00
		Excess salt	0.12	Excess salt	0.12	Percs slowly	0.50
						Excess salt	0.12
NaB:							
Naclina	93	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.70	Too clayey	0.70	Too clayey	0.70
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
NaD:							
Naclina	93	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50	Percs slowly	0.50	Slope	1.00
						Percs slowly	0.50
NeB:							
Nacogdoches	85	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.01			Slope	0.12
						Droughty	0.01
NeE:							
Nacogdoches	90	Not limited		Not limited		Not limited	
Ow:							
Owentown	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.50	Flooding	0.50	Flooding	0.50
		Droughty	0.08			Droughty	0.08
PeC:							
Penning	50	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.04	Depth to saturated zone	0.04	Droughty	0.04
		Depth to saturated zone	0.04			Depth to saturated zone	0.04
Kurth	40	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.23			Droughty	0.23
PoA:							
Pophers	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99	Depth to saturated zone	0.99

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
RaD:							
Rayburn	85	Somewhat limited		Somewhat limited		Very limited	
		Percs slowly	0.50	Percs slowly	0.50	Slope	1.00
		Droughty	0.01			Percs slowly	0.50
						Droughty	0.01
RkB:							
Raylake	85	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
RkD:							
Raylake	95	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.70	Too clayey	0.70	Slope	1.00
		Percs slowly	0.50	Percs slowly	0.50	Too clayey	0.70
		Droughty	0.01			Percs slowly	0.50
						Droughty	0.01
RnB:							
Rentzel	75	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Depth to saturated zone	0.44	Depth to saturated zone	0.44
		Depth to saturated zone	0.44	Droughty	0.13		
RsB:							
Rosenwall	85	Very limited		Very limited		Very limited	
		Droughty	1.00	Percs slowly	1.00	Droughty	1.00
		Percs slowly	1.00	Bedrock	0.71	Percs slowly	1.00
		Bedrock	0.71	Droughty	0.39	Bedrock	0.71
RsD:							
Rosenwall	90	Very limited		Very limited		Very limited	
		Droughty	1.00	Percs slowly	1.00	Droughty	1.00
		Percs slowly	1.00	Bedrock	0.71	Percs slowly	1.00
		Bedrock	0.71	Droughty	0.37	Slope	1.00
						Bedrock	0.71
SaB:							
Sacul	85	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Droughty	0.01	Droughty	1.00
SeB:							
Sawlit	80	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Depth to saturated zone	0.04	Depth to saturated zone	0.04	Depth to saturated zone	0.04
SfA:							
Sawtown	85	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.10			Droughty	0.10

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SmB:							
Smithdale-----------	90	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.03			Droughty	0.03
TeD:							
Tehran--------------	86	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Droughty	0.32	Slope	1.00
						Too sandy	0.50
TnB:							
Tenaha--------------	90	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Droughty	0.01		
TnD:							
Tenaha--------------	85	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50	Droughty	0.01	Slope	1.00
TnG:							
Tenaha--------------	80	Somewhat limited		Somewhat limited		Very limited	
		Droughty	0.99	Slope	0.78	Slope	1.00
		Slope	0.78	Too sandy	0.50	Droughty	0.99
		Too sandy	0.50				
TsB:							
Tonkawa-------------	85	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Droughty	0.92	Droughty	1.00
		Too sandy	1.00	Too sandy	0.50	Too sandy	0.50
TsD:							
Tonkawa-------------	85	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Droughty	0.92	Droughty	1.00
		Too sandy	1.00	Too sandy	0.50	Slope	1.00
						Too sandy	0.50
Tu:							
Tuscosso------------	85	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.50	Flooding	0.50	Flooding	1.00
TuD:							
Trawick-------------	80	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.19	Too clayey	0.19	Slope	1.00
		Droughty	0.17	Too gravelly, cobbly, or stony	0.07	Too clayey	0.19
		Too gravelly, cobbly, or stony	0.07			Droughty	0.17
						Too gravelly, cobbly, or stony	0.07

Table 15.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuG:							
Trawick	85	Somewhat limited		Somewhat limited		Very limited	
		Droughty	0.29	Slope	0.22	Slope	1.00
		Slope	0.22	Too clayey	0.19	Droughty	0.29
		Too clayey	0.19			Too clayey	0.19
WeB:							
Woden	80	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.01			Droughty	0.01
W:							
Water	100	Not rated		Not rated		Not rated	

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:					
Alazan	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
				Too clayey	0.11
AbA:					
Alazan	45	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
Besner	40	Not limited		Not limited	
AtA:					
Alto	85	Not limited		Somewhat limited	
				Too clayey	0.81
AtB:					
Attoyac	85	Not limited		Not limited	
AuD:					
Austonio	80	Very limited		Not limited	
		Potentially or highly erodible	1.00		
		Slope	1.00		
BaB:					
Bernaldo	90	Not limited		Not limited	
BeA:					
Besner	85	Not limited		Not limited	
BfA:					
Betis	95	Somewhat limited		Not limited	
		Droughty	0.16		
BoC:					
Bowie	80	Not limited		Not limited	
BuB:					
Bub	80	Very limited		Very limited	
		Bedrock	1.00	Too clayey	1.00
		Droughty	0.98	10-20" to Bedrock (Hard or Soft)	0.46
		Too clayey	0.19		
ChA:					
Chireno	95	Somewhat limited		Very limited	
		Too clayey	0.05	Too clayey	1.00

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CoB:					
Corrigan	85	Somewhat limited		Very limited	
		Depth to saturated zone	0.94	Too clayey	1.00
		Percs slowly	0.50	Depth to saturated zone	0.94
		Bedrock	0.29		
CrG:					
Cuthbert	75	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Too clayey	0.19		
		Too gravelly, cobbly, or stony	0.07		
CtE:					
Cuthbert	75	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
CtG:					
Cuthbert	85	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
CtS:					
Cuthbert	85	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
CuE:					
Cuthbert	90	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Too gravelly, cobbly, or stony	0.51		
DaC:					
Darco	80	Somewhat limited		Very limited	
		Droughty	0.32	Dense layer	1.00
		Slope	0.12		
DaE:					
Darco	85	Very limited		Very limited	
		Slope	1.00	Dense layer	1.00
		Droughty	0.32		
DsA:					
Dreka	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99
				Too clayey	0.24
EeB:					
Eastwood	95	Somewhat limited		Very limited	
		Percs slowly	0.50	Too clayey	1.00

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Burrowing mammals and reptiles: Rating class and limiting features	Value
EeD:					
Eastwood	95	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Percs slowly	0.50		
ElA:					
Eastwood	50	Somewhat limited		Very limited	
		Percs slowly	0.50	Too clayey	1.00
Latex	35	Somewhat limited		Not limited	
		Percs slowly	0.33		
EtB:					
Etoile	95	Somewhat limited		Very limited	
		Percs slowly	0.50	Too clayey	1.00
EtD:					
Etoile	95	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Percs slowly	0.50		
GaA:					
Gallime	47	Not limited		Not limited	
Alazan	35	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
				Too clayey	0.14
GaB:					
Gallime	85	Not limited		Not limited	
GaC:					
Gallime	48	Not limited		Not limited	
Guyton	39	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Too clayey	0.14
GrB:					
Grapeland	85	Somewhat limited		Not limited	
		Droughty	0.11		
GtA:					
Guyton	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.33	Too clayey	0.01

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GuA:					
Guyton	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.33		
Sawtown	40	Not limited		Not limited	
HaA:					
Hainesville	85	Not limited		Not limited	
Hc:					
Hannahatchee	90	Somewhat limited		Very limited	
		Flooding	0.50	Flooding	1.00
HeB:					
Herty	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.50	Too clayey	1.00
Ia:					
Iulus	70	Somewhat limited		Very limited	
		Flooding	0.50	Flooding	1.00
		Depth to saturated zone	0.04	Depth to saturated zone	0.04
Iu:					
Iulus	70	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.04	Depth to saturated zone	0.04
KhB:					
Kirvin	85	Not limited		Very limited	
				Too clayey	1.00
KiC:					
Kirvin	90	Somewhat limited		Very limited	
		Too gravelly, cobbly, or stony	0.51	Too clayey	1.00
KiD:					
Kirvin	100	Somewhat limited		Somewhat limited	
		Slope	0.12	Too clayey	0.93
		Too clayey	0.01		
KkD:					
Kisatchie	90	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Bedrock	0.90		
		Percs slowly	0.50		
		Droughty	0.10		

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
KuB:					
Kurth	80	Not limited		Not limited	
KwA:					
Kawah	90	Somewhat limited		Somewhat limited	
		Droughty	0.92	Too Sandy	0.50
		Too sandy	0.50	Depth to saturated zone	0.44
		Depth to saturated zone	0.44		
La:					
Laneville	94	Somewhat limited		Very limited	
		Flooding	0.50	Flooding	1.00
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
				Too clayey	0.24
LaB:					
LaCerda	90	Somewhat limited		Very limited	
		Too clayey	0.70	Too clayey	1.00
		Percs slowly	0.50		
LaE:					
LaCerda	90	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Too clayey	0.70		
		Percs slowly	0.50		
Lb:					
Laneville	84	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
		Percs slowly	0.33		
LdB:					
Latex	87	Not limited		Not limited	
LiB:					
Letney	70	Very limited		Not limited	
		Potentially or highly erodible	1.00		
		Too sandy	0.50		
LiC:					
Lilbert	80	Somewhat limited		Not limited	
		Droughty	0.19		
LiD:					
Letney	70	Very limited		Not limited	
		Slope	1.00		
		Too sandy	0.50		
		Droughty	0.02		

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
LnB:					
Lovelady	85	Very limited		Not limited	
		Potentially or highly erodible	1.00		
		Droughty	0.09		
LnD:					
Lovelady	85	Very limited		Not limited	
		Potentially or highly erodible	1.00		
		Slope	0.88		
		Droughty	0.27		
MaE:					
Maben	90	Very limited		Somewhat limited	
		Slope	1.00	Too clayey	0.95
MaG:					
Maben	90	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
Mf:					
Mattex	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.94	Depth to saturated zone	0.94
		Percs slowly	0.33		
MhC:					
Meth	80	Not limited		Very limited	
				Too clayey	1.00
Mi:					
Mattex	60	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.94	Depth to saturated zone	0.94
		Percs slowly	0.33		
Iulus	30	Somewhat limited		Very limited	
		Flooding	0.50	Flooding	1.00
		Depth to saturated zone	0.04	Depth to saturated zone	0.04
MiQ:					
Pits, mine or quarry, gravelly	85	Not rated		Not rated	

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MiS:					
Metcalf	45	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Depth to saturated zone	0.75
		Percs slowly	1.00		
		Depth to saturated zone	0.75		
Sawtown	35	Very limited		Not limited	
		Potentially or highly erodible	1.00		
MpA:					
Mollville	45	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.33	Too clayey	0.01
Besner	40	Not limited		Not limited	
MsB:					
Moswell	85	Somewhat limited		Very limited	
		Percs slowly	0.50	Too clayey	1.00
		Excess salt	0.12		
MsD:					
Moswell	90	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Percs slowly	0.50		
		Excess salt	0.12		
NaB:					
Naclina	93	Somewhat limited		Very limited	
		Too clayey	0.70	Too clayey	1.00
		Percs slowly	0.50		
NaD:					
Naclina	93	Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00
		Slope	1.00		
		Percs slowly	0.50		
NeB:					
Nacogdoches	85	Very limited		Very limited	
		Potentially or highly erodible	1.00	Too clayey	1.00
		Slope	0.12		
NeE:					
Nacogdoches	90	Not limited		Very limited	
				Too clayey	1.00

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ow:					
Owentown	80	Somewhat limited		Very limited	
		Flooding	0.50	Flooding	1.00
PeC:					
Penning	50	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Depth to saturated zone	0.04
		Depth to saturated zone	0.04		
Kurth	40	Very limited		Not limited	
		Potentially or highly erodible	1.00		
PoA:					
Pophers	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99
				Too clayey	0.11
RaD:					
Rayburn	85	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Percs slowly	0.50		
RkB:					
Raylake	85	Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50		
RkD:					
Raylake	95	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Too clayey	0.70		
		Percs slowly	0.50		
RnB:					
Rentzel	75	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
		Droughty	0.13		
RsB:					
Rosenwall	85	Very limited		Very limited	
		Percs slowly	1.00	Too clayey	1.00
		Bedrock	0.71		
		Droughty	0.39		
RsD:					
Rosenwall	90	Very limited		Very limited	
		Percs slowly	1.00	Too clayey	1.00
		Slope	1.00		
		Bedrock	0.71		
		Droughty	0.37		

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SaB:					
Sacul	85	Somewhat limited		Very limited	
		Droughty	0.01	Too clayey	1.00
SeB:					
Sawlit	80	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Depth to saturated zone	0.04
		Depth to saturated zone	0.04	Too clayey	0.01
SfA:					
Sawtown	85	Not limited		Not limited	
SmB:					
Smithdale	90	Not limited		Not limited	
TeD:					
Tehran	86	Very limited		Not limited	
		Slope	1.00		
		Too sandy	0.50		
		Droughty	0.32		
TnB:					
Tenaha	90	Somewhat limited		Not limited	
		Droughty	0.01		
TnD:					
Tenaha	85	Very limited		Not limited	
		Slope	1.00		
		Droughty	0.01		
TnG:					
Tenaha	80	Very limited		Somewhat limited	
		Slope	1.00	Too clayey	0.01
TsB:					
Tonkawa	85	Somewhat limited		Somewhat limited	
		Droughty	0.92	Too Sandy	0.50
		Too sandy	0.50		
TsD:					
Tonkawa	85	Very limited		Somewhat limited	
		Slope	1.00	Too Sandy	0.50
		Droughty	0.92		
		Too sandy	0.50		
Tu:					
Tuscosso	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
				Too clayey	1.00

Table 16.--Irrigated Domestic Grasses and Legumes, and Burrowing Mammals and Reptiles for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TuD:					
Trawick-------------	80	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Too clayey	0.19		
		Too gravelly, cobbly, or stony	0.07		
TuG:					
Trawick-------------	85	Very limited		Very limited	
		Slope	1.00	Too clayey	1.00
		Too clayey	0.19		
WeB:					
Woden---------------	80	Not limited		Not limited	
W:					
Water---------------	100	Not rated		Not rated	

Table 17.--Upland Native Herbaceous Plants, and Upland Shrubs and Vines for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:					
Alazan	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
AbA:					
Alazan	45	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
Besner	40	Not limited		Not limited	
AtA:					
Alto	85	Not limited		Not limited	
AtB:					
Attoyac	85	Not limited		Not limited	
AuD:					
Austonio	80	Not limited		Not limited	
BaB:					
Bernaldo	90	Not limited		Not limited	
BeA:					
Besner	85	Not limited		Not limited	
BfA:					
Betis	95	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
BoC:					
Bowie	80	Not limited		Not limited	
BuB:					
Bub	80	Not limited		Somewhat limited	
				Bedrock	0.19
ChA:					
Chireno	95	Not limited		Not limited	
CoB:					
Corrigan	85	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.94	Depth to saturated zone	0.94
				Bedrock	0.91

Table 17.--Upland Native Herbaceous Plants, and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CrG:					
Cuthbert	75	Not limited		Not limited	
CtE:					
Cuthbert	75	Not limited		Not limited	
CtG:					
Cuthbert	85	Not limited		Not limited	
CtS:					
Cuthbert	85	Not limited		Not limited	
CuE:					
Cuthbert	90	Not limited		Not limited	
DaC:					
Darco	80	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
DaE:					
Darco	85	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
DsA:					
Dreka	75	Very limited		Very limited	
		Depth to saturated zone	0.99	Depth to saturated zone	0.99
EeB:					
Eastwood	95	Not limited		Not limited	
EeD:					
Eastwood	95	Not limited		Not limited	
ElA:					
Eastwood	50	Not limited		Not limited	
Latex	35	Not limited		Not limited	
EtB:					
Etoile	95	Not limited		Not limited	
EtD:					
Etoile	95	Not limited		Not limited	
GaA:					
Gallime	47	Not limited		Not limited	
Alazan	35	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
GaB:					
Gallime	85	Not limited		Not limited	

Table 17.--Upland Native Herbaceous Plants, and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
GaC:					
Gallime	48	Not limited		Not limited	
Guyton	39	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
GrB:					
Grapeland	85	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
GtA:					
Guyton	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
GuA:					
Guyton	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
Sawtown	40	Not limited		Not limited	
HaA:					
Hainesville	85	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
Hc:					
Hannahatchee	90	Not limited		Not limited	
HeB:					
Herty	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Bedrock	1.00
		Excess sodium	0.32	Depth to saturated zone	1.00
Ia:					
Iulus	70	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.04	Depth to saturated zone	0.04
Iu:					
Iulus	70	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.04	Depth to saturated zone	0.04
KhB:					
Kirvin	85	Not limited		Not limited	
KiC:					
Kirvin	90	Not limited		Not limited	
KiD:					
Kirvin	100	Not limited		Not limited	

Table 17.--Upland Native Herbaceous Plants, and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Upland native herbaceous plants: Value	Upland shrubs and vines: Rating class and limiting features	Upland shrubs and vines: Value
KkD:					
Kisatchie	90	Not limited		Somewhat limited	
				Bedrock	0.62
KuB:					
Kurth	80	Not limited		Very limited	
				Bedrock	1.00
KwA:					
Kawah	90	Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
La:					
Laneville	94	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
LaB:					
LaCerda	90	Not limited		Not limited	
LaE:					
LaCerda	90	Not limited		Not limited	
Lb:					
Laneville	84	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
LdB:					
Latex	87	Not limited		Not limited	
LiB:					
Letney	70	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
LiC:					
Lilbert	80	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
LiD:					
Letney	70	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
LnB:					
Lovelady	85	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
LnD:					
Lovelady	85	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40

Table 17.--Upland Native Herbaceous Plants, and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
MaE:					
Maben	90	Not limited		Not limited	
MaG:					
Maben	90	Not limited		Not limited	
Mf:					
Mattex	75	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.94	Depth to saturated zone	0.94
MhC:					
Meth	80	Not limited		Not limited	
Mi:					
Mattex	60	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.94	Depth to saturated zone	0.94
Iulus	30	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.04	Depth to saturated zone	0.04
MiQ:					
Pits, mine or quarry, gravelly	85	Not rated		Not rated	
MiS:					
Metcalf	45	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
Sawtown	35	Not limited		Not limited	
MpA:					
Mollville	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
Besner	40	Not limited		Not limited	
MsB:					
Moswell	85	Somewhat limited		Somewhat limited	
		Excess salt	0.01	Excess salt	0.01
MsD:					
Moswell	90	Somewhat limited		Somewhat limited	
		Excess salt	0.01	Excess salt	0.01
NaB:					
Naclina	93	Not limited		Not limited	
NaD:					
Naclina	93	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50

Table 17.--Upland Native Herbaceous Plants, and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
NeB:					
Nacogdoches	85	Not limited		Not limited	
NeE:					
Nacogdoches	90	Not limited		Not limited	
Ow:					
Owentown	80	Not limited		Not limited	
PeC:					
Penning	50	Somewhat limited		Very limited	
		Depth to saturated zone	0.04	Bedrock	1.00
				Depth to saturated zone	0.04
Kurth	40	Not limited		Not limited	
PoA:					
Pophers	85	Very limited		Very limited	
		Depth to saturated zone	0.99	Depth to saturated zone	0.99
RaD:					
Rayburn	85	Not limited		Very limited	
				Bedrock	1.00
RkB:					
Raylake	85	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50
RkD:					
Raylake	95	Not limited		Not limited	
RnB:					
Rentzel	75	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.44
		Sandy surface	0.40	Sandy surface	0.40
RsB:					
Rosenwall	85	Not limited		Somewhat limited	
				Bedrock	0.76
RsD:					
Rosenwall	90	Not limited		Somewhat limited	
				Bedrock	0.76
SaB:					
Sacul	85	Not limited		Not limited	
SeB:					
Sawlit	80	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.04	Depth to saturated zone	0.04

Table 17.--Upland Native Herbaceous Plants, and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Upland native herbaceous plants: Value	Upland shrubs and vines: Rating class and limiting features	Upland shrubs and vines: Value
SfA:					
Sawtown	85	Not limited		Not limited	
SmB:					
Smithdale	90	Not limited		Not limited	
TeD:					
Tehran	86	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
TnB:					
Tenaha	90	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
TnD:					
Tenaha	85	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
TnG:					
Tenaha	80	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Sandy surface	0.40
TsB:					
Tonkawa	85	Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60
TsD:					
Tonkawa	85	Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60
Tu:					
Tuscosso	85	Not limited		Not limited	
TuD:					
Trawick	80	Not limited		Very limited	
				Bedrock	1.00
TuG:					
Trawick	85	Not limited		Very limited	
				Bedrock	1.00
WeB:					
Woden	80	Not limited		Not limited	
W:					
Water	100	Not rated		Not rated	

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland coniferous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:							
Alazan	90	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.86	Depth to saturated zone	1.00
						Growing season wetness	1.00
AbA:							
Alazan	45	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.86	Depth to saturated zone	1.00
						Growing season wetness	1.00
Besner	40	Not limited		Not limited		Not limited	
AtA:							
Alto	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.95	Depth to saturated zone	0.02	Depth to saturated zone	0.95
						Growing season wetness	0.50
AtB:							
Attoyac	85	Not limited		Not limited		Not limited	
AuD:							
Austonio	80	Not limited		Not limited		Not limited	
BaB:							
Bernaldo	90	Not limited		Not limited		Somewhat limited	
						Growing season wetness	0.50
BeA:							
Besner	85	Not limited		Not limited		Not limited	
BfA:							
Betis	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.16	Droughty	0.16	Droughty	0.16
BoC:							
Bowie	80	Somewhat limited		Not limited		Very limited	
		Depth to saturated zone	0.22			Growing season wetness	1.00
						Depth to saturated zone	0.22
BuB:							
Bub	80	Very limited		Very limited		Very limited	
		Bedrock	1.00	Bedrock	1.00	Bedrock	1.00
		Droughty	0.98	Droughty	0.98	Droughty	0.98

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value	Upland coniferous trees: Rating class and limiting features	Value	Upland mixed deciduous and coniferous trees: Rating class and limiting features	Value
ChA:							
Chireno-------------	95	Somewhat limited		Not limited		Very limited	
		Depth to saturated zone	0.22			Growing season wetness	1.00
						Depth to saturated zone	0.22
CoB:							
Corrigan------------	85	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.96	Depth to saturated zone	1.00
		Bedrock	0.29	Bedrock	0.29	Growing season wetness	0.50
						Bedrock	0.29
CrG:							
Cuthbert------------	75	Not limited		Not limited		Not limited	
CtE:							
Cuthbert------------	75	Not limited		Not limited		Not limited	
CtG:							
Cuthbert------------	85	Not limited		Not limited		Not limited	
CtS:							
Cuthbert------------	85	Not limited		Not limited		Not limited	
CuE:							
Cuthbert------------	90	Not limited		Not limited		Not limited	
DaC:							
Darco---------------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.32	Droughty	0.32	Droughty	0.32
DaE:							
Darco---------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.32	Droughty	0.32	Droughty	0.32
DsA:							
Dreka---------------	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
						Growing season wetness	1.00
EeB:							
Eastwood------------	95	Not limited		Not limited		Not limited	
EeD:							
Eastwood------------	95	Not limited		Not limited		Not limited	

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Upland deciduous trees: Value	Upland coniferous trees: Rating class and limiting features	Upland coniferous trees: Value	Upland mixed deciduous and coniferous trees: Rating class and limiting features	Upland mixed deciduous and coniferous trees: Value
ElA:							
Eastwood	50	Not limited		Not limited		Not limited	
Latex	35	Somewhat limited		Not limited		Very limited	
		Depth to saturated zone	0.68			Growing season wetness	1.00
						Depth to saturated zone	0.68
EtB:							
Etoile	95	Not limited		Not limited		Not limited	
EtD:							
Etoile	95	Not limited		Not limited		Not limited	
GaA:							
Gallime	47	Not limited		Not limited		Somewhat limited	
						Growing season wetness	0.50
Alazan	35	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.86	Depth to saturated zone	1.00
						Growing season wetness	1.00
GaB:							
Gallime	85	Not limited		Not limited		Somewhat limited	
						Growing season wetness	0.50
GaC:							
Gallime	48	Not limited		Not limited		Somewhat limited	
						Growing season wetness	0.50
Guyton	39	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Growing season wetness	1.00
GrB:							
Grapeland	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.11	Droughty	0.11	Droughty	0.11
GtA:							
Guyton	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Growing season wetness	1.00

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value	Upland coniferous trees: Rating class and limiting features	Value	Upland mixed deciduous and coniferous trees: Rating class and limiting features	Value
GuA:							
Guyton	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Growing season wetness	1.00
Sawtown	40	Somewhat limited		Not limited		Somewhat limited	
		Depth to saturated zone	0.22			Growing season wetness	0.50
						Depth to saturated zone	0.22
HaA:							
Hainesville	85	Not limited		Not limited		Very limited	
						Growing season wetness	1.00
Hc:							
Hannahatchee	90	Not limited		Not limited		Not limited	
HeB:							
Herty	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Growing season wetness	1.00
Ia:							
Iulus	70	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.24	Depth to saturated zone	1.00
						Growing season wetness	1.00
Iu:							
Iulus	70	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.24	Depth to saturated zone	1.00
						Growing season wetness	1.00
KhB:							
Kirvin	85	Not limited		Not limited		Not limited	
KiC:							
Kirvin	90	Not limited		Not limited		Not limited	
KiD:							
Kirvin	100	Not limited		Not limited		Not limited	
KkD:							
Kisatchie	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Bedrock	0.90	Bedrock	0.90	Bedrock	0.90
		Droughty	0.10	Droughty	0.10	Droughty	0.10

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland coniferous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KuB:							
Kurth	80	Not limited		Not limited		Not limited	
KwA:							
Kawah	90	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Droughty	0.92	Depth to saturated zone	1.00
		Droughty	0.92	Depth to saturated zone	0.68	Growing season wetness	1.00
						Droughty	0.92
La:							
Laneville	94	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.68	Depth to saturated zone	1.00
						Growing season wetness	1.00
LaB:							
LaCerda	90	Not limited		Not limited		Not limited	
LaE:							
LaCerda	90	Not limited		Not limited		Not limited	
Lb:							
Laneville	84	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.68	Depth to saturated zone	1.00
						Growing season wetness	1.00
LdB:							
Latex	87	Somewhat limited		Not limited		Very limited	
		Depth to saturated zone	0.68			Growing season wetness	1.00
						Depth to saturated zone	0.68
LiB:							
Letney	70	Not limited		Not limited		Not limited	
LiC:							
Lilbert	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.19	Droughty	0.19	Droughty	0.19
LiD:							
Letney	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.02	Droughty	0.02	Droughty	0.02
LnB:							
Lovelady	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.99	Depth to saturated zone	0.09	Growing season wetness	1.00
		Droughty	0.09	Droughty	0.09	Depth to saturated zone	0.99
						Droughty	0.09

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value	Upland coniferous trees: Rating class and limiting features	Value	Upland mixed deciduous and coniferous trees: Rating class and limiting features	Value
LnD:							
Lovelady	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.99	Droughty	0.27	Growing season wetness	1.00
		Droughty	0.27	Depth to saturated zone	0.09	Depth to saturated zone	0.99
						Droughty	0.27
MaE:							
Maben	90	Not limited		Not limited		Not limited	
MaG:							
Maben	90	Not limited		Not limited		Not limited	
Mf:							
Mattex	75	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.96	Depth to saturated zone	1.00
						Growing season wetness	0.50
MhC:							
Meth	80	Not limited		Not limited		Not limited	
Mi:							
Mattex	60	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.96	Depth to saturated zone	1.00
						Growing season wetness	0.50
Iulus	30	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.24	Depth to saturated zone	1.00
						Growing season wetness	1.00
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	
MiS:							
Metcalf	45	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.86	Depth to saturated zone	1.00
						Growing season wetness	1.00
Sawtown	35	Somewhat limited		Not limited		Somewhat limited	
		Depth to saturated zone	0.68			Depth to saturated zone	0.68
						Growing season wetness	0.50

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland coniferous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MpA:							
Mollville	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Growing season wetness	1.00
Besner	40	Not limited		Not limited		Not limited	
MsB:							
Moswell	85	Not limited		Not limited		Not limited	
MsD:							
Moswell	90	Not limited		Not limited		Not limited	
NaB:							
Naclina	93	Not limited		Not limited		Not limited	
NaD:							
Naclina	93	Not limited		Not limited		Not limited	
NeB:							
Nacogdoches	85	Not limited		Not limited		Not limited	
NeE:							
Nacogdoches	90	Not limited		Not limited		Not limited	
Ow:							
Owentown	80	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.95	Depth to saturated zone	0.02	Growing season wetness	1.00
						Depth to saturated zone	0.95
PeC:							
Penning	50	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.24	Depth to saturated zone	1.00
						Growing season wetness	1.00
Kurth	40	Not limited		Not limited		Not limited	
PoA:							
Pophers	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
						Growing season wetness	1.00
RaD:							
Rayburn	85	Somewhat limited		Not limited		Somewhat limited	
		Depth to saturated zone	0.84			Depth to saturated zone	0.84

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value	Upland coniferous trees: Rating class and limiting features	Value	Upland mixed deciduous and coniferous trees: Rating class and limiting features	Value
RkB:							
Raylake	85	Not limited		Not limited		Not limited	
RkD:							
Raylake	95	Not limited		Not limited		Not limited	
RnB:							
Rentzel	75	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.68	Depth to saturated zone	1.00
		Droughty	0.13	Droughty	0.13	Growing season wetness	0.50
						Droughty	0.13
RsB:							
Rosenwall	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Bedrock	0.71	Bedrock	0.71	Bedrock	0.71
		Droughty	0.39	Droughty	0.39	Droughty	0.39
RsD:							
Rosenwall	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Bedrock	0.71	Bedrock	0.71	Bedrock	0.71
		Droughty	0.37	Droughty	0.37	Droughty	0.37
SaB:							
Sacul	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.99	Depth to saturated zone	0.09	Growing season wetness	1.00
		Droughty	0.01	Droughty	0.01	Depth to saturated zone	0.99
						Droughty	0.01
SeB:							
Sawlit	80	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.24	Depth to saturated zone	1.00
						Growing season wetness	1.00
SfA:							
Sawtown	85	Somewhat limited		Not limited		Somewhat limited	
		Depth to saturated zone	0.22			Growing season wetness	0.50
						Depth to saturated zone	0.22
SmB:							
Smithdale	90	Not limited		Not limited		Not limited	
TeD:							
Tehran	86	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.32	Droughty	0.32	Droughty	0.32
TnB:							
Tenaha	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.01	Droughty	0.01	Droughty	0.01

Table 18.--Upland Deciduous Trees, Upland Coniferous Trees, Mixed Deciduous and Coniferous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value	Upland coniferous trees: Rating class and limiting features	Value	Upland mixed deciduous and coniferous trees: Rating class and limiting features	Value
TnD:							
Tenaha	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.01	Droughty	0.01	Droughty	0.01
TnG:							
Tenaha	80	Not limited		Not limited		Not limited	
TsB:							
Tonkawa	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.92	Droughty	0.92	Droughty	0.92
TsD:							
Tonkawa	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.92	Droughty	0.92	Droughty	0.92
Tu:							
Tuscosso	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.99	Depth to saturated zone	0.09	Growing season wetness	1.00
						Depth to saturated zone	0.99
TuD:							
Trawick	80	Not limited		Not limited		Not limited	
TuG:							
Trawick	85	Not limited		Not limited		Not limited	
WeB:							
Woden	80	Not limited		Not limited		Not limited	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
AaB:			
Alazan	90	Somewhat limited	
		Too acid	0.78
		Seepage	0.76
AbA:			
Alazan	45	Somewhat limited	
		Too acid	0.78
		Seepage	0.76
Besner	40	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.22
AtA:			
Alto	85	Somewhat limited	
		Seepage	0.07
		Too dry	0.04
		Too acid	0.04
AtB:			
Attoyac	85	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.44
AuD:			
Austonio	80	Very limited	
		Too dry	1.00
		Slope	1.00
		Seepage	0.76
		Too acid	0.44
BaB:			
Bernaldo	90	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.22
BeA:			
Besner	85	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.22

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
BfA:			
Betis	95	Very limited	
		Too dry	1.00
		Seepage	1.00
		Too sandy	0.50
		Too acid	0.44
		Slope	0.08
BoC:			
Bowie	80	Somewhat limited	
		Too acid	0.78
		Too dry	0.78
		Seepage	0.76
BuB:			
Bub	80	Very limited	
		Too dry	1.00
		Too acid	0.22
		Seepage	0.07
		Slope	0.02
ChA:			
Chireno	95	Somewhat limited	
		Too dry	0.78
		Seepage	0.01
CoB:			
Corrigan	85	Somewhat limited	
		Too acid	0.99
		Seepage	0.07
CrG:			
Cuthbert	75	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	1.00
		Seepage	0.07
CtE:			
Cuthbert	75	Very limited	
		Too dry	1.00
		Too acid	1.00
		Slope	1.00
		Seepage	0.76
CtG:			
Cuthbert	85	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	0.99
		Seepage	0.76

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
CtS:			
Cuthbert	85	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	1.00
		Seepage	0.76
CuE:			
Cuthbert	90	Very limited	
		Too dry	1.00
		Too acid	1.00
		Slope	1.00
		Seepage	0.76
DaC:			
Darco	80	Very limited	
		Too dry	1.00
		Seepage	1.00
		Too sandy	0.50
		Slope	0.32
		Too acid	0.22
DaE:			
Darco	85	Very limited	
		Too dry	1.00
		Seepage	1.00
		Slope	1.00
		Too sandy	0.50
		Too acid	0.22
DsA:			
Dreka	75	Somewhat limited	
		Seepage	0.07
EeB:			
Eastwood	95	Very limited	
		Too dry	1.00
		Too acid	0.99
		Seepage	0.07
EeD:			
Eastwood	95	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	0.99
		Seepage	0.07
ElA:			
Eastwood	50	Very limited	
		Too dry	1.00
		Too acid	0.99
		Seepage	0.07
Latex	35	Somewhat limited	
		Too acid	0.92
		Seepage	0.76
		Too dry	0.32

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
EtB:			
Etoile	95	Very limited	
		Too dry	1.00
		Too acid	0.14
		Seepage	0.07
EtD:			
Etoile	95	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	0.14
		Seepage	0.07
GaA:			
Gallime	47	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.44
Alazan	35	Somewhat limited	
		Seepage	0.76
		Too acid	0.22
GaB:			
Gallime	85	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.44
GaC:			
Gallime	48	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.04
Guyton	39	Very limited	
		Too acid	1.00
		Seepage	0.07
GrB:			
Grapeland	85	Very limited	
		Too dry	1.00
		Seepage	1.00
		Too acid	1.00
		Too sandy	0.50
GtA:			
Guyton	95	Somewhat limited	
		Too acid	0.44
		Seepage	0.07
GuA:			
Guyton	45	Very limited	
		Too acid	1.00
		Seepage	0.07

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
Sawtown	40	Somewhat limited	
		Too acid	0.92
		Too dry	0.78
		Seepage	0.76
HaA:			
Hainesville	85	Very limited	
		Too dry	1.00
		Seepage	1.00
		Too sandy	0.50
		Too acid	0.44
Hc:			
Hannahatchee	90	Very limited	
		Too dry	1.00
		Seepage	0.76
HeB:			
Herty	80	Very limited	
		Too acid	1.00
		Seepage	0.07
Ia:			
Iulus	70	Somewhat limited	
		Too acid	0.44
		Seepage	0.07
Iu:			
Iulus	70	Somewhat limited	
		Seepage	0.76
		Too acid	0.44
KhB:			
Kirvin	85	Very limited	
		Too dry	1.00
		Too acid	1.00
		Seepage	0.76
KiC:			
Kirvin	90	Very limited	
		Too dry	1.00
		Too acid	1.00
		Seepage	0.76
KiD:			
Kirvin	100	Very limited	
		Too dry	1.00
		Too acid	1.00
		Slope	0.32
		Seepage	0.07
KkD:			
Kisatchie	90	Very limited	
		Too dry	1.00
		Too acid	1.00
		Slope	1.00
		Seepage	0.07

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
KuB:			
Kurth---------------	80	Very limited	
		Too dry	1.00
		Too acid	0.14
		Seepage	0.07
KwA:			
Kawah---------------	90	Very limited	
		Too sandy	1.00
		Seepage	1.00
		Too acid	0.92
La:			
Laneville-----------	94	Somewhat limited	
		Too acid	0.99
		Seepage	0.07
LaB:			
LaCerda-------------	90	Very limited	
		Too dry	1.00
		Too acid	0.44
LaE:			
LaCerda-------------	90	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	0.44
Lb:			
Laneville-----------	84	Somewhat limited	
		Too acid	0.99
		Seepage	0.07
LdB:			
Latex---------------	87	Somewhat limited	
		Too acid	0.78
		Seepage	0.76
		Too dry	0.32
LiB:			
Letney--------------	70	Very limited	
		Too dry	1.00
		Seepage	1.00
		Too sandy	0.50
		Too acid	0.44
LiC:			
Lilbert-------------	80	Very limited	
		Too dry	1.00
		Seepage	1.00
		Too acid	0.56
		Too sandy	0.50

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
LiD:			
Letney	70	Very limited	
		Too dry	1.00
		Seepage	1.00
		Slope	1.00
		Too sandy	0.50
		Too acid	0.44
LnB:			
Lovelady	85	Very limited	
		Seepage	1.00
		Too sandy	0.50
		Too acid	0.44
		Too dry	0.01
LnD:			
Lovelady	85	Very limited	
		Seepage	1.00
		Slope	0.92
		Too sandy	0.50
		Too acid	0.44
		Too dry	0.01
MaE:			
Maben	90	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	0.92
		Seepage	0.07
MaG:			
Maben	90	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	0.44
		Seepage	0.07
Mf:			
Mattex	75	Very limited	
		Too acid	1.00
		Seepage	0.07
MhC:			
Meth	80	Very limited	
		Too dry	1.00
		Too acid	0.44
		Seepage	0.07
Mi:			
Mattex	60	Very limited	
		Too acid	1.00
		Seepage	0.07
Iulus	30	Somewhat limited	
		Too acid	0.44
		Seepage	0.07

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
MiQ:			
Pits, mine or quarry, gravelly	85	Very limited	
		Too dry	1.00
		Seepage	1.00
MiS:			
Metcalf	45	Somewhat limited	
		Too acid	0.92
		Seepage	0.07
Sawtown	35	Somewhat limited	
		Too acid	0.92
		Seepage	0.76
		Too dry	0.32
MpA:			
Mollville	45	Somewhat limited	
		Too acid	0.44
		Seepage	0.01
Besner	40	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.22
MsB:			
Moswell	85	Very limited	
		Too dry	1.00
		Too acid	1.00
		Seepage	0.07
MsD:			
Moswell	90	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	1.00
		Seepage	0.07
NaB:			
Naclina	93	Very limited	
		Too dry	1.00
		Too acid	0.44
NaD:			
Naclina	93	Very limited	
		Too dry	1.00
		Slope	1.00
NeB:			
Nacogdoches	85	Very limited	
		Too dry	1.00
		Too acid	0.78
		Slope	0.32
		Seepage	0.07

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
NeE:			
Nacogdoches	90	Very limited	
		Too dry	1.00
		Too acid	0.78
		Seepage	0.07
Ow:			
Owentown	80	Somewhat limited	
		Too acid	0.14
		Seepage	0.07
		Too dry	0.04
PeC:			
Penning	50	Somewhat limited	
		Seepage	0.76
		Too acid	0.44
Kurth	40	Very limited	
		Too dry	1.00
		Too acid	0.14
		Seepage	0.07
PoA:			
Pophers	85	Very limited	
		Too acid	1.00
		Excess salt	0.01
		Seepage	0.01
RaD:			
Rayburn	85	Very limited	
		Slope	1.00
		Too acid	1.00
		Too dry	0.16
		Seepage	0.07
RkB:			
Raylake	85	Very limited	
		Too dry	1.00
		Too acid	0.78
RkD:			
Raylake	95	Very limited	
		Too dry	1.00
		Too acid	1.00
		Slope	1.00
		Seepage	0.01
RnB:			
Rentzel	75	Very limited	
		Seepage	1.00
		Too acid	1.00
		Too sandy	0.50

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
RsB:			
Rosenwall	85	Very limited	
		Too dry	1.00
		Too acid	0.92
		Seepage	0.76
RsD:			
Rosenwall	90	Very limited	
		Too dry	1.00
		Slope	1.00
		Too acid	0.92
		Seepage	0.76
SaB:			
Sacul	85	Somewhat limited	
		Too acid	0.44
		Seepage	0.07
		Too dry	0.01
SeB:			
Sawlit	80	Somewhat limited	
		Seepage	0.76
		Too acid	0.44
SfA:			
Sawtown	85	Somewhat limited	
		Too acid	0.92
		Too dry	0.78
		Seepage	0.76
SmB:			
Smithdale	90	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.44
TeD:			
Tehran	86	Very limited	
		Too dry	1.00
		Seepage	1.00
		Slope	1.00
		Too sandy	0.50
		Too acid	0.44
TnB:			
Tenaha	90	Very limited	
		Too dry	1.00
		Seepage	1.00
		Too acid	1.00
		Too sandy	0.50
TnD:			
Tenaha	85	Very limited	
		Too dry	1.00
		Seepage	1.00
		Slope	1.00
		Too acid	1.00
		Too sandy	0.50

Table 19.--Irrigated Freshwater Wetland Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated freshwater wetland plants: Rating class and limiting features	Value
TnG:			
Tenaha	80	Very limited	
		Too dry	1.00
		Seepage	1.00
		Slope	1.00
		Too acid	1.00
		Too sandy	0.50
TsB:			
Tonkawa	85	Very limited	
		Too dry	1.00
		Too sandy	1.00
		Seepage	1.00
		Too acid	1.00
		Slope	0.08
TsD:			
Tonkawa	85	Very limited	
		Too dry	1.00
		Too sandy	1.00
		Seepage	1.00
		Slope	1.00
		Too acid	1.00
Tu:			
Tuscosso	85	Somewhat limited	
		Too acid	0.44
		Seepage	0.07
		Too dry	0.01
TuD:			
Trawick	80	Very limited	
		Too dry	1.00
		Slope	1.00
		Seepage	0.07
TuG:			
Trawick	85	Very limited	
		Too dry	1.00
		Slope	1.00
		Seepage	0.07
WeB:			
Woden	80	Very limited	
		Too dry	1.00
		Seepage	0.76
		Too acid	0.04
W:			
Water	100	Not rated	

Table 20.--Dwellings and Small Commercial Buildings

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
AaB:							
Alazan	90	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.39	Shrink-swell	0.50	Depth to saturated zone	0.39
AbA:							
Alazan	45	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
Besner	40	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
AtA:							
Alto	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Depth to saturated zone	0.90	Shrink-swell	0.50
				Shrink-swell	0.50		
AtB:							
Attoyac	85	Not limited		Not limited		Not limited	
AuD:							
Austonio	80	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Shrink-swell	0.50
BaB:							
Bernaldo	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Depth to saturated zone	0.15	Shrink-swell	0.50
BeA:							
Besner	85	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
BfA:							
Betis	95	Not limited		Not limited		Not limited	
BoC:							
Bowie	80	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.47		
BuB:							
Bub	80	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 20.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
ChA:							
Chireno-------------	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.47		
CoB:							
Corrigan------------	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.81	Shrink-swell	1.00	Depth to saturated zone	0.81
				Depth to soft bedrock	0.29		
CrG:							
Cuthbert------------	75	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Shrink-swell	0.50
CtE:							
Cuthbert------------	75	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Shrink-swell	0.50
CtG:							
Cuthbert------------	85	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
CtS:							
Cuthbert------------	85	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
CuE:							
Cuthbert------------	90	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Shrink-swell	0.50
DaC:							
Darco---------------	80	Not limited		Not limited		Somewhat limited	
						Slope	0.12
DaE:							
Darco---------------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
DsA:							
Dreka---------------	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 20.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
EeB:							
Eastwood	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
EeD:							
Eastwood	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
ElA:							
Eastwood	50	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
Latex	35	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
				Depth to saturated zone	0.73		
EtB:							
Etoile	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
EtD:							
Etoile	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
GaA:							
Gallime	47	Not limited		Somewhat limited		Not limited	
				Shrink-swell	0.50		
				Depth to saturated zone	0.15		
Alazan	35	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
GaB:							
Gallime	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.15		
GaC:							
Gallime	48	Not limited		Somewhat limited		Not limited	
				Shrink-swell	0.50		
				Depth to saturated zone	0.15		
Guyton	39	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GrB:							
Grapeland	85	Not limited		Not limited		Not limited	

Table 20.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
GtA:							
Guyton	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GuA:							
Guyton	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Sawtown	40	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
				Depth to saturated zone	0.47		
HaA:							
Hainesville	85	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
Hc:							
Hannahatchee	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
HeB:							
Herty	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Ia:							
Iulus	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.99		
Iu:							
Iulus	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.99		
KhB:							
Kirvin	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
KiC:							
Kirvin	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
KiD:							
Kirvin	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12

Table 20.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
KkD:							
Kisatchie-----------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Depth to soft bedrock	0.90	Slope	1.00
				Slope	0.16		
KuB:							
Kurth---------------	85	Not limited		Somewhat limited		Not limited	
				Shrink-swell	0.50		
KwA:							
Kawah---------------	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
La:							
Laneville-----------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.07	Shrink-swell	0.50	Depth to saturated zone	0.07
LaB:							
LaCerda-------------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
LaE:							
LaCerda-------------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
Lb:							
Laneville-----------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
				Shrink-swell	1.00		
LdB:							
Latex---------------	87	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Depth to saturated zone	0.73	Shrink-swell	0.50
				Shrink-swell	0.50		
LiB:							
Letney--------------	70	Not limited		Not limited		Not limited	
LiC:							
Lilbert-------------	80	Not limited		Not limited		Not limited	
LiD:							
Letney--------------	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00

Table 20.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
LnB:							
Lovelady------------	85	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.95		
LnD:							
Lovelady------------	85	Not limited		Somewhat limited		Somewhat limited	
				Depth to saturated zone	0.95	Slope	0.88
				Shrink-swell	0.50		
MaE:							
Maben---------------	90	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Slope	0.16	Shrink-swell	1.00
		Slope	0.16			Slope	1.00
MaG:							
Maben---------------	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	1.00			Shrink-swell	1.00
Mf:							
Mattex--------------	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.81	Depth to saturated zone	1.00	Depth to saturated zone	0.81
				Shrink-swell	0.50		
MhC:							
Meth----------------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Mi:							
Mattex--------------	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.81	Depth to saturated zone	1.00	Depth to saturated zone	0.81
				Shrink-swell	0.50		
Iulus---------------	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.99		
MiQ:							
Pits, mine or quarry, gravelly---	85	Not rated		Not rated		Not rated	
MiS:							
Metcalf-------------	45	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
				Shrink-swell	1.00		
Sawtown-------------	35	Not limited		Very limited		Not limited	
				Shrink-swell	1.00		
				Depth to saturated zone	0.73		

Table 20.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
MpA:							
Mollville	45	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Besner	40	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
MsB:							
Moswell	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
MsD:							
Moswell	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
NaB:							
Naclina	93	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
NaD:							
Naclina	93	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
NeB:							
Nacogdoches	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
NeE:							
Nacogdoches	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Ow:							
Owentown	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.90		
PeC:							
Penning	50	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.99		
Kurth	40	Not limited		Somewhat limited		Not limited	
				Shrink-swell	0.50		
PoA:							
Pophers	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 20.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
RaD:							
Rayburn	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Depth to saturated zone	0.82	Slope	1.00
				Slope	0.16		
RkB:							
Raylake	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
RkD:							
Raylake	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
RnB:							
Rentzel	75	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
RsB:							
Rosenwall	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to soft bedrock	0.71		
RsD:							
Rosenwall	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Depth to soft bedrock	0.71	Slope	1.00
				Slope	0.16		
SaB:							
Sacul	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
				Shrink-swell	0.50		
SeB:							
Sawlit	80	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
				Depth to saturated zone	0.99		
SfA:							
Sawtown	85	Not limited		Somewhat limited		Not limited	
				Shrink-swell	0.50		
				Depth to saturated zone	0.47		
SmB:							
Smithdale	90	Not limited		Not limited		Not limited	

Table 20.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TeD:							
Tehran--------------	86	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
TnB:							
Tenaha--------------	90	Not limited		Not limited		Not limited	
TnD:							
Tenaha--------------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
TnG:							
Tenaha--------------	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
TsB:							
Tonkawa-------------	85	Not limited		Not limited		Not limited	
TsD:							
Tonkawa-------------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Tu:							
Tuscosso------------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.95		
TuD:							
Trawick-------------	80	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Shrink-swell	0.50
TuG:							
Trawick-------------	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
WeB:							
Woden---------------	80	Not limited		Not limited		Not limited	
W:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:							
Alazan	90	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Depth to saturated zone	0.19				
AbA:							
Alazan	45	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Cutbanks cave	0.10		
Besner	40	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
				Cutbanks cave	0.10		
AtA:							
Alto	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.90		
		Shrink-swell	0.50	Too clayey	0.32		
				Cutbanks cave	0.10		
AtB:							
Attoyac	85	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.22	Cutbanks cave	0.10		
AuD:							
Austonio	80	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	1.00	Slope	0.16
		Shrink-swell	0.50	Slope	0.16		
		Slope	0.16				
BaB:							
Bernaldo	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.15		
		Shrink-swell	0.50	Cutbanks cave	0.10		
BeA:							
Besner	85	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
				Cutbanks cave	0.10		

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
BfA:							
Betis	95	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.18
BoC:							
Bowie	80	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.47		
				Cutbanks cave	0.10		
BuB:							
Bub	80	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.98
		Shrink-swell	0.50				
ChA:							
Chireno	95	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.47		
		Shrink-swell	1.00	Cutbanks cave	0.10		
				Too clayey	0.02		
CoB:							
Corrigan	85	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.48
		Shrink-swell	1.00	Too clayey	0.50	Depth to bedrock	0.29
		Depth to saturated zone	0.48	Depth to soft bedrock	0.29		
				Cutbanks cave	0.10		
CrG:							
Cuthbert	75	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.28	Slope	0.16
		Shrink-swell	0.50	Slope	0.16	Gravel	0.01
		Slope	0.16	Cutbanks cave	0.10		
CtE:							
Cuthbert	75	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.28	Slope	0.16
		Shrink-swell	0.50	Slope	0.16		
		Slope	0.16	Cutbanks cave	0.10		
CtG:							
Cuthbert	85	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	0.50	Cutbanks cave	0.10		
CtS:							
Cuthbert	85	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	0.50	Cutbanks cave	0.10		

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
CuE:							
Cuthbert	90	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.28	Gravel	0.24
		Shrink-swell	0.50	Slope	0.16	Slope	0.16
		Slope	0.16	Cutbanks cave	0.10		
DaC:							
Darco	80	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.34
DaE:							
Darco	85	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Cutbanks cave	1.00	Slope	0.63
				Slope	0.63	Droughty	0.34
DsA:							
Dreka	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Low strength	1.00	Flooding	0.80	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Cutbanks cave	0.10		
		Shrink-swell	0.50	Too clayey	0.03		
EeB:							
Eastwood	95	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.72		
		Shrink-swell	1.00	Cutbanks cave	0.10		
EeD:							
Eastwood	95	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.72	Slope	0.16
		Shrink-swell	1.00	Slope	0.16		
		Slope	0.16	Cutbanks cave	0.10		
ElA:							
Eastwood	50	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.72		
		Shrink-swell	1.00	Cutbanks cave	0.10		
Latex	35	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Depth to saturated zone	0.73		
		Shrink-swell	0.50	Too clayey	0.12		
				Cutbanks cave	0.10		
EtB:							
Etoile	95	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.50		
		Shrink-swell	1.00	Cutbanks cave	0.10		
EtD:							
Etoile	95	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.50	Slope	0.16
		Shrink-swell	1.00	Slope	0.16		
		Slope	0.16	Cutbanks cave	0.10		

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GaA:							
Gallime	47	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
				Cutbanks cave	0.10		
Alazan	35	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Cutbanks cave	0.10		
GaB:							
Gallime	85	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to saturated zone	0.15		
		Low strength	0.22	Cutbanks cave	0.10		
GaC:							
Gallime	48	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
				Cutbanks cave	0.10		
Guyton	39	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
GrB:							
Grapeland	85	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.12
GtA:							
Guyton	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
GuA:							
Guyton	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
Sawtown	40	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Depth to saturated zone	0.47		
		Shrink-swell	0.50	Cutbanks cave	0.10		
				Too clayey	0.03		
HaA:							
Hainesville	85	Not limited		Very limited		Not limited	
				Cutbanks cave	1.00		
				Depth to saturated zone	0.15		

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hc:							
Hannahatchee	90	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
				Cutbanks cave	0.10		
HeB:							
Herty	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Too clayey	0.88		
		Shrink-swell	1.00	Cutbanks cave	0.10		
Ia:							
Iulus	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
				Depth to saturated zone	0.99		
				Flooding	0.60		
Iu:							
Iulus	90	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.99	Flooding	1.00
				Flooding	0.80		
				Cutbanks cave	0.10		
KhB:							
Kirvin	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	0.50	Cutbanks cave	0.10		
KiC:							
Kirvin	90	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.28	Gravel	0.24
		Shrink-swell	0.50	Cutbanks cave	0.10		
KiD:							
Kirvin	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
KkD:							
Kisatchie	90	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.90	Depth to bedrock	0.90
		Shrink-swell	1.00	Too clayey	0.50	Slope	0.16
		Slope	0.16	Slope	0.16	Droughty	0.11
				Cutbanks cave	0.10		
KuB:							
Kurth	85	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
KwA:							
Kawah	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.03	Depth to saturated zone	1.00	Droughty	0.92
				Cutbanks cave	1.00	Depth to saturated zone	0.03
La:							
Laneville	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Low strength	1.00	Flooding	0.60	Depth to saturated zone	0.03
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Depth to saturated zone	0.03	Too clayey	0.03		
LaB:							
LaCerda	90	Very limited		Very limited		Not limited	
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	1.00	Cutbanks cave	1.00		
LaE:							
LaCerda	90	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Slope	0.16
		Shrink-swell	1.00	Cutbanks cave	1.00		
		Slope	0.16	Slope	0.16		
Lb:							
Laneville	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Low strength	1.00	Flooding	0.80	Depth to saturated zone	0.03
		Depth to saturated zone	0.03	Cutbanks cave	0.10		
				Too clayey	0.03		
LdB:							
Latex	87	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Depth to saturated zone	0.73		
		Shrink-swell	0.50	Too clayey	0.12		
				Cutbanks cave	0.10		
LiB:							
Letney	70	Not limited		Very limited		Not limited	
				Cutbanks cave	1.00		
LiC:							
Lilbert	80	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.21
LiD:							
Letney	70	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Cutbanks cave	1.00	Slope	0.16
				Slope	0.16	Droughty	0.03

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
LnB:							
Lovelady	85	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.10
				Depth to saturated zone	0.95		
LnD:							
Lovelady	85	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.29
				Depth to saturated zone	0.95		
MaE:							
Maben	90	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.16	Slope	0.16
		Shrink-swell	1.00				
		Slope	0.16				
MaG:							
Maben	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00				
Mf:							
Mattex	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	0.48	Flooding	0.80	Depth to saturated zone	0.48
				Cutbanks cave	0.10		
				Too clayey	0.03		
MhC:							
Meth	80	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	0.50	Cutbanks cave	0.10		
Mi:							
Mattex	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	0.48	Flooding	0.80	Depth to saturated zone	0.48
				Cutbanks cave	0.10		
				Too clayey	0.03		
Iulus	30	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.99	Flooding	0.60
				Flooding	0.60		
				Cutbanks cave	0.10		
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MiS:							
Metcalf	45	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Too clayey	0.50		
				Cutbanks cave	0.10		
Sawtown	35	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.73		
				Cutbanks cave	0.10		
MpA:							
Mollville	45	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
Besner	40	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15		
				Cutbanks cave	0.10		
MsB:							
Moswell	85	Very limited		Very limited		Not limited	
		Low strength	1.00	Too clayey	1.00		
		Shrink-swell	1.00	Cutbanks cave	0.10		
MsD:							
Moswell	90	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Slope	0.16
		Shrink-swell	1.00	Slope	0.16		
		Slope	0.16	Cutbanks cave	0.10		
NaB:							
Naclina	93	Very limited		Very limited		Not limited	
		Low strength	1.00	Cutbanks cave	1.00		
		Shrink-swell	1.00	Too clayey	0.50		
NaD:							
Naclina	93	Very limited		Very limited		Very limited	
		Low strength	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Shrink-swell	1.00	Too clayey	0.50	Slope	0.16
		Slope	0.16	Slope	0.16		
NeB:							
Nacogdoches	85	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Too clayey	0.50		
		Low strength	0.10	Cutbanks cave	0.10		
NeE:							
Nacogdoches	90	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Too clayey	0.50		
		Low strength	0.10	Cutbanks cave	0.10		

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ow:							
Owentown	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.90	Flooding	0.60
				Flooding	0.60		
				Cutbanks cave	0.10		
PeC:							
Penning	50	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.99		
				Cutbanks cave	0.10		
Kurth	40	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
PoA:							
Pophers	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Low strength	1.00	Flooding	0.80	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Cutbanks cave	0.10		
		Shrink-swell	0.50				
RaD:							
Rayburn	85	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	0.82	Slope	0.16
		Shrink-swell	1.00	Too clayey	0.50		
		Slope	0.16	Slope	0.16		
				Cutbanks cave	0.10		
RkB:							
Raylake	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.72		
RkD:							
Raylake	95	Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Slope	0.16
		Low strength	1.00	Too clayey	0.72		
		Slope	0.16	Slope	0.16		
RnB:							
Rentzel	75	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.03	Depth to saturated zone	1.00	Droughty	0.14
				Cutbanks cave	1.00	Depth to saturated zone	0.03
RsB:							
Rosenwall	85	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Depth to bedrock	0.71
		Shrink-swell	1.00	Depth to soft bedrock	0.71	Droughty	0.41
				Cutbanks cave	0.10		

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
RsD:							
Rosenwall	90	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Too clayey	1.00	Depth to bedrock	0.71
		Shrink-swell	1.00	Depth to soft bedrock	0.71	Droughty	0.39
		Slope	0.16	Slope	0.16	Slope	0.16
				Cutbanks cave	0.10		
SaB:							
Sacul	85	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	0.95	Droughty	0.01
		Shrink-swell	0.50	Too clayey	0.28		
				Cutbanks cave	0.10		
SeB:							
Sawlit	80	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.99		
		Shrink-swell	0.50	Cutbanks cave	0.10		
SfA:							
Sawtown	85	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.47		
				Cutbanks cave	0.10		
				Too clayey	0.03		
SmB:							
Smithdale	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
TeD:							
Tehran	86	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Cutbanks cave	1.00	Droughty	0.34
				Slope	0.16	Slope	0.16
TnB:							
Tenaha	90	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.01
TnD:							
Tenaha	85	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Cutbanks cave	1.00	Slope	0.16
				Slope	0.16	Droughty	0.01
TnG:							
Tenaha	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	0.22	Cutbanks cave	1.00		
TsB:							
Tonkawa	85	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.92

Table 21.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TsD:							
Tonkawa	85	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Cutbanks cave	1.00	Droughty	0.92
				Slope	0.63	Slope	0.63
Tu:							
Tuscosso	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.95	Flooding	1.00
		Low strength	1.00	Flooding	0.80		
		Shrink-swell	1.00	Too clayey	0.12		
				Cutbanks cave	0.10		
TuD:							
Trawick	80	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.16	Slope	0.16
		Shrink-swell	0.50	Cutbanks cave	0.10	Gravel	0.01
		Slope	0.16	Too clayey	0.03		
TuG:							
Trawick	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50	Too clayey	0.03		
WeB:							
Woden	80	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
W:							
Water	100	Not rated		Not rated		Not rated	

Table 22.--Sewage Disposal

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:					
Alazan	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Seepage	0.50
AbA:					
Alazan	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Seepage	0.50
Besner	40	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
		Depth to saturated zone	0.40		
AtA:					
Alto	85	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Seepage	0.50
		Slow water movement	1.00		
AtB:					
Attoyac	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
AuD:					
Austonio	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50	Slope	1.00
		Slope	0.16		
BaB:					
Bernaldo	90	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
		Depth to saturated zone	0.40		

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
BeA:					
Besner	85	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
		Depth to saturated zone	0.40		
BfA:					
Betis	95	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Slope	0.32
BoC:					
Bowie	80	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Depth to saturated zone	0.94	Slope	0.08
BuB:					
Bub	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	0.18
ChA:					
Chireno	95	Very limited		Somewhat limited	
		Slow water movement	1.00	Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
CoB:					
Corrigan	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Depth to saturated zone	0.94
				Seepage	0.50
				Slope	0.08
CrG:					
Cuthbert	75	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		
CtE:					
Cuthbert	75	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
CtG:					
Cuthbert	85	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
CtS:					
Cuthbert	85	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
CuE:					
Cuthbert	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		
DaC:					
Darco	80	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
				Slope	0.68
DaE:					
Darco	85	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.50	Seepage	1.00
DsA:					
Dreka	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
EeB:					
Eastwood	95	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
EeD:					
Eastwood	95	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		
ElA:					
Eastwood	50	Very limited		Not limited	
		Slow water movement	1.00		

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Latex	35	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Depth to saturated zone	1.00		
EtB:					
Etoile	95	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
EtD:					
Etoile	95	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		
GaA:					
Gallime	47	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
		Depth to saturated zone	0.40		
Alazan	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Seepage	1.00
GaB:					
Gallime	85	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
		Depth to saturated zone	0.40		
GaC:					
Gallime	48	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
		Depth to saturated zone	0.40		
Guyton	39	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
GrB:					
Grapeland	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Slope	0.08

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GtA:					
Guyton	95	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
GuA:					
Guyton	45	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
Sawtown	40	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Depth to saturated zone	0.94		
HaA:					
Hainesville	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to saturated zone	0.40		
Hc:					
Hannahatchee	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	0.50	Seepage	0.50
HeB:					
Herty	80	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.42
		Depth to bedrock	0.78		
Ia:					
Iulus	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	0.04
		Slow water movement	0.50		
Iu:					
Iulus	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	0.50
		Slow water movement	0.50	Depth to saturated zone	0.04

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
KhB:					
Kirvin	85	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	0.08
KiC:					
Kirvin	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
KiD:					
Kirvin	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.68
KkD:					
Kisatchie	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.16	Slope	1.00
KuB:					
Kurth	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
		Depth to bedrock	0.01		
KwA:					
Kawah	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Filtering capacity	1.00		
La:					
Laneville	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Seepage	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	0.44
LaB:					
LaCerda	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
LaE:					
LaCerda	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Lb:					
Laneville	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Seepage	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	0.44
LdB:					
Latex	87	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
		Depth to saturated zone	1.00		
LiB:					
Letney	70	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.08
LiC:					
Lilbert	80	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
				Slope	0.08
LiD:					
Letney	70	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	0.16	Slope	1.00
LnB:					
Lovelady	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	0.08
LnD:					
Lovelady	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Slope	1.00
MaE:					
Maben	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16	Seepage	0.27
MaG:					
Maben	90	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.27

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Mf:					
Mattex	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	0.94
		Depth to saturated zone	1.00	Seepage	0.50
MhC:					
Meth	80	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
				Slope	0.08
Mi:					
Mattex	60	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	0.94
		Depth to saturated zone	1.00	Seepage	0.50
Iulus	30	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	0.50
		Slow water movement	0.50	Depth to saturated zone	0.04
MiQ:					
Pits, mine or quarry, gravelly	85	Not rated		Not rated	
MiS:					
Metcalf	45	Very limited		Somewhat limited	
		Slow water movement	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	1.00		
Sawtown	35	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Depth to saturated zone	1.00		
MpA:					
Mollville	45	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
		Seepage, bottom layer	1.00		

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Besner	40	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
		Depth to saturated zone	0.40		
MsB:					
Moswell	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
MsD:					
Moswell	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		
NaB:					
Naclina	93	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
NaD:					
Naclina	93	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		
NeB:					
Nacogdoches	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.68
NeE:					
Nacogdoches	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
Ow:					
Owentown	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50		
PeC:					
Penning	50	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.42
		Depth to bedrock	0.78	Depth to saturated zone	0.04

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Kurth	40	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
				Slope	0.08
PoA:					
Pophers	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
RaD:					
Rayburn	85	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.84
		Depth to bedrock	0.94		
		Slope	0.16		
RkB:					
Raylake	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
RkD:					
Raylake	95	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.16		
RnB:					
Rentzel	75	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	0.44
				Slope	0.08
RsB:					
Rosenwall	85	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.08
RsD:					
Rosenwall	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.16		

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SaB:					
Sacul	85	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Slope	0.08
		Slow water movement	1.00		
SeB:					
Sawlit	80	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	0.04
SfA:					
Sawtown	85	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Depth to saturated zone	0.94		
SmB:					
Smithdale	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.08
TeD:					
Tehran	86	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	0.16	Slope	1.00
TnB:					
Tenaha	90	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
				Slope	0.08
TnD:					
Tenaha	85	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Slope	0.16	Slope	1.00
TnG:					
Tenaha	80	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	1.00
TsB:					
Tonkawa	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Slope	0.32

Table 22.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TsD:					
Tonkawa	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
		Filtering capacity	1.00	Seepage	1.00
		Slope	0.63		
Tu:					
Tuscosso	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
TuD:					
Trawick	80	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Depth to bedrock	0.99	Depth to soft bedrock	0.99
		Slope	0.16	Seepage	0.27
TuG:					
Trawick	80	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Depth to soft bedrock	0.99
		Depth to bedrock	0.99	Seepage	0.27
WeB:					
Woden	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
W:					
Water	100	Not rated		Not rated	

Table 23.--Landfills

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
AaB:							
Alazan	90	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
		Too clayey	0.50			Too clayey	0.50
AbA:							
Alazan	45	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
Besner	40	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
				Seepage	1.00		
AtA:							
Alto	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
		Depth to saturated zone	0.24			Depth to saturated zone	0.02
AtB:							
Attoyac	85	Not limited		Not limited		Not limited	
AuD:							
Austonio	80	Very limited		Somewhat limited		Somewhat limited	
		Seepage, bottom layer	1.00	Slope	0.16	Slope	0.16
		Slope	0.16				
BaB:							
Bernaldo	90	Not limited		Not limited		Not limited	
BeA:							
Besner	85	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
				Seepage	1.00		
BfA:							
Betis	95	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	0.50			Too sandy	0.50
BoC:							
Bowie	80	Not limited		Not limited		Not limited	

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
BuB:							
Bub	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
ChA:							
Chireno	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
CoB:							
Corrigan	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Depth to saturated zone	0.94	Hard to compact	1.00
		Too clayey	1.00			Depth to bedrock	1.00
						Depth to saturated zone	0.96
CrG:							
Cuthbert	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	0.16
CtE:							
Cuthbert	75	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.16	Too clayey	1.00
		Slope	0.16			Slope	0.16
CtG:							
Cuthbert	85	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
CtS:							
Cuthbert	85	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
CuE:							
Cuthbert	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	0.16
DaC:							
Darco	80	Somewhat limited		Very limited		Very limited	
		Too sandy	0.50	Seepage	1.00	Seepage	1.00
						Too sandy	0.50
DaE:							
Darco	85	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Seepage	1.00	Seepage	1.00
		Too sandy	0.50	Slope	0.63	Slope	0.63
						Too sandy	0.50

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
DsA:							
Dreka	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
EeB:							
Eastwood	95	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
EeD:							
Eastwood	95	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.16	Too clayey	1.00
		Slope	0.16			Hard to compact	1.00
						Slope	0.16
ElA:							
Eastwood	50	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Too clayey	1.00
Latex	35	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
		Depth to saturated zone	0.02			Hard to compact	1.00
EtB:							
Etoile	95	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
EtD:							
Etoile	95	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.16	Too clayey	1.00
		Slope	0.16			Hard to compact	1.00
						Slope	0.16
GaA:							
Gallime	47	Not limited		Very limited		Not limited	
				Seepage	1.00		
Alazan	35	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
GaB:							
Gallime	85	Not limited		Very limited		Not limited	
				Seepage	1.00		
GaC:							
Gallime	48	Not limited		Very limited		Not limited	
				Seepage	1.00		

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Guyton	39	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
GrB:							
Grapeland	85	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	0.50			Too sandy	0.50
GtA:							
Guyton	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
GuA:							
Guyton	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Sawtown	40	Very limited		Very limited		Very limited	
		Too clayey	1.00	Seepage	1.00	Hard to compact	1.00
HaA:							
Hainesville	85	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	0.50
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	0.50
		Too sandy	0.50				
Hc:							
Hannahatchee	90	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
HeB:							
Herty	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.42	Too clayey	1.00
		Too clayey	1.00			Depth to bedrock	0.42
Ia:							
Iulus	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.24
		Seepage, bottom layer	1.00	Depth to saturated zone	0.04		
		Depth to saturated zone	0.68				

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Iu:							
Iulus	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.24
		Depth to saturated zone	0.68	Depth to saturated zone	0.04		
KhB:							
Kirvin	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
		Seepage, bottom layer	1.00			Hard to compact	1.00
KiC:							
Kirvin	90	Not limited		Not limited		Very limited	
						Too clayey	1.00
KiD:							
Kirvin	90	Not limited		Not limited		Somewhat limited	
						Too clayey	0.50
KkD:							
Kisatchie	90	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Too clayey	1.00	Slope	0.16	Hard to compact	1.00
		Slope	0.16			Depth to bedrock	1.00
						Slope	0.16
KuB:							
Kurth	85	Very limited		Not limited		Not limited	
		Depth to bedrock	1.00				
KwA:							
Kawah	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00			Depth to saturated zone	0.68
La:							
Laneville	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.68
		Depth to saturated zone	0.95	Depth to saturated zone	0.44	Too clayey	0.50
		Too clayey	0.50				
LaB:							
LaCerda	90	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LaE:							
LaCerda	90	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.16	Too clayey	1.00
		Slope	0.16			Hard to compact	1.00
						Slope	0.16
Lb:							
Laneville	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Too clayey	1.00	Depth to saturated zone	0.44	Depth to saturated zone	0.68
		Depth to saturated zone	0.95				
LdB:							
Latex	87	Somewhat limited		Not limited		Not limited	
		Depth to saturated zone	0.02				
LiB:							
Letney	70	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
LiC:							
Lilbert	80	Somewhat limited		Very limited		Somewhat limited	
		Too sandy	0.50	Seepage	1.00	Too sandy	0.50
LiD:							
Letney	70	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
		Slope	0.16	Slope	0.16	Slope	0.16
LnB:							
Lovelady	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.44	Seepage	1.00	Depth to saturated zone	0.09
LnD:							
Lovelady	85	Somewhat limited		Very limited		Somewhat limited	
		Too clayey	0.50	Seepage	1.00	Depth to saturated zone	0.09
		Depth to saturated zone	0.44				
MaE:							
Maben	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	0.16
MaG:							
Maben	90	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
						Hard to compact	1.00

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Mf:							
Mattex	75	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.96
		Depth to saturated zone	1.00	Depth to saturated zone	0.94		
		Too clayey	1.00				
MhC:							
Meth	80	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Mi:							
Mattex	60	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.96
		Depth to saturated zone	1.00	Depth to saturated zone	0.94		
		Too clayey	1.00				
Iulus	30	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.24
		Depth to saturated zone	0.68	Depth to saturated zone	0.04		
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Very limited		Not rated	
				Not rated	1.00		
				Seepage	1.00		
MiS:							
Metcalf	45	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	0.75	Hard to compact	1.00
		Depth to saturated zone	0.99			Depth to saturated zone	0.86
Sawtown	35	Somewhat limited		Very limited		Very limited	
		Too clayey	0.50	Seepage	1.00	Hard to compact	1.00
		Depth to saturated zone	0.02				
MpA:							
Mollville	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00				

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Besner	40	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
				Seepage	1.00		
MsB:							
Moswell	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
MsD:							
Moswell	90	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.16	Too clayey	1.00
		Slope	0.16			Hard to compact	1.00
						Slope	0.16
NaB:							
Naclina	93	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
NaD:							
Naclina	93	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.16	Too clayey	1.00
		Slope	0.16			Hard to compact	1.00
						Slope	0.16
NeB:							
Nacogdoches	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
						Hard to compact	0.50
NeE:							
Nacogdoches	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
						Hard to compact	0.50
Ow:							
Owentown	80	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.02
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Seepage, bottom layer	1.00				
PeC:							
Penning	50	Very limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	1.00	Depth to bedrock	0.42	Depth to bedrock	0.42
		Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24
Kurth	40	Not limited		Not limited		Not limited	

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
PoA:							
Pophers	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
RaD:							
Rayburn	85	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	0.84	Too clayey	1.00
		Too clayey	1.00	Slope	0.16	Hard to compact	1.00
		Slope	0.16			Depth to bedrock	0.84
		Depth to saturated zone	0.09			Slope	0.16
RkB:							
Raylake	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
RkD:							
Raylake	95	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.16	Too clayey	1.00
		Slope	0.16			Hard to compact	1.00
						Slope	0.16
RnB:							
Rentzel	75	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.95	Seepage	1.00	Depth to saturated zone	0.68
				Depth to saturated zone	0.44		
RsB:							
Rosenwall	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
						Depth to bedrock	1.00
RsD:							
Rosenwall	90	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Too clayey	1.00	Slope	0.16	Hard to compact	1.00
		Seepage, bottom layer	1.00			Depth to bedrock	1.00
		Slope	0.16			Slope	0.16
SaB:							
Sacul	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
		Depth to saturated zone	0.44			Hard to compact	1.00
						Depth to saturated zone	0.09

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
SeB:							
Sawlit	80	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.68	Depth to saturated zone	0.04	Hard to compact	1.00
		Too clayey	0.50			Depth to saturated zone	0.24
SfA:							
Sawtown	85	Not limited		Very limited		Not limited	
				Seepage	1.00		
SmB:							
Smithdale	90	Not limited		Not limited		Not limited	
TeD:							
Tehran	86	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	0.50	Slope	0.16	Too sandy	0.50
		Slope	0.16			Slope	0.16
TnB:							
Tenaha	90	Not limited		Very limited		Not limited	
				Seepage	1.00		
TnD:							
Tenaha	85	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Seepage	1.00	Slope	0.16
				Slope	0.16		
TnG:							
Tenaha	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
				Seepage	1.00		
TsB:							
Tonkawa	85	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00			Seepage	1.00
TsD:							
Tonkawa	85	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	0.63	Seepage	1.00
		Slope	0.63			Slope	0.63
Tu:							
Tuscosso	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	1.00			Depth to saturated zone	0.09

Table 23.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuD:							
Trawick-------------	80	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	0.99	Too clayey	1.00
		Too clayey	1.00	Slope	0.16	Hard to compact	1.00
		Slope	0.16			Depth to bedrock	0.99
						Slope	0.16
TuG:							
Trawick-------------	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.99	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
						Depth to bedrock	0.99
WeB:							
Woden---------------	80	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
W:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 24.--Source of Gravel and Sand

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
AaB:					
Alazan	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AbA:					
Alazan	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Besner	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AtA:					
Alto	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AtB:					
Attoyac	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AuD:					
Austonio	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
BaB:					
Bernaldo	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BeA:					
Besner	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BfA:					
Betis	95	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.08
BoC:					
Bowie	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 24.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
BuB:					
Bub	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ChA:					
Chireno	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CoB:					
Corrigan	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CrG:					
Cuthbert	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CtE:					
Cuthbert	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CtG:					
Cuthbert	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CtS:					
Cuthbert	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CuE:					
Cuthbert	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DaC:					
Darco	80	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.05
DaE:					
Darco	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.05
DsA:					
Dreka	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 24.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
EeB:					
Eastwood	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EeD:					
Eastwood	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ElA:					
Eastwood	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Latex	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EtB:					
Etoile	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EtD:					
Etoile	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GaA:					
Gallime	47	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Alazan	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GaB:					
Gallime	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
GaC:					
Gallime	48	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Guyton	39	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GrB:					
Grapeland	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.02
		Thickest layer	0.00	Bottom layer	0.05

Table 24.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
GtA:					
Guyton	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GuA:					
Guyton	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sawtown	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
HaA:					
Hainesville	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.05
		Thickest layer	0.00	Bottom layer	0.06
Hc:					
Hannahatchee	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
HeB:					
Herty	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ia:					
Iulus	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.02
		Thickest layer	0.00	Bottom layer	0.06
Iu:					
Iulus	70	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
KhB:					
Kirvin	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KiC:					
Kirvin	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KiD:					
Kirvin	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 24.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
KkD:					
Kisatchie-----------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KuB:					
Kurth---------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KwA:					
Kawah---------------	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.31
		Thickest layer	0.00	Thickest layer	0.31
La:					
Laneville-----------	94	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LaB:					
LaCerda-------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LaE:					
LaCerda-------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lb:					
Laneville-----------	84	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LdB:					
Latex---------------	87	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LiB:					
Letney--------------	70	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.08
LiC:					
Lilbert-------------	80	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.05
LiD:					
Letney--------------	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 24.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
LnB:					
Lovelady	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
LnD:					
Lovelady	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
MaE:					
Maben	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MaG:					
Maben	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mf:					
Mattex	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MhC:					
Meth	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mi:					
Mattex	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Iulus	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
MiQ:					
Pits, mine or quarry, gravelly	85	Not rated		Not rated	
MiS:					
Metcalf	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sawtown	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MpA:					
Mollville	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06

Table 24.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Potential source of gravel: Value	Potential source of sand: Rating class	Potential source of sand: Value
Besner	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MsB:					
Moswell	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MsD:					
Moswell	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NaB:					
Naclina	93	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NaD:					
Naclina	93	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NeB:					
Nacogdoches	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NeE:					
Nacogdoches	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ow:					
Owentown	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.02
		Thickest layer	0.00	Bottom layer	0.04
PeC:					
Penning	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kurth	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
PoA:					
Pophers	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RaD:					
Rayburn	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 24.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
RkB:					
Raylake	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RkD:					
Raylake	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RnB:					
Rentzel	75	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
RsB:					
Rosenwall	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RsD:					
Rosenwall	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SaB:					
Sacul	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SeB:					
Sawlit	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SfA:					
Sawtown	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
SmB:					
Smithdale	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
TeD:					
Tehran	86	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.08
TnB:					
Tenaha	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.05

Table 24.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
TnD:					
Tenaha--------------	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.05
TnG:					
Tenaha--------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TsB:					
Tonkawa-------------	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.25
		Thickest layer	0.00	Thickest layer	0.25
TsD:					
Tonkawa-------------	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.25
		Thickest layer	0.00	Thickest layer	0.25
Tu:					
Tuscosso------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TuD:					
Trawick-------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TuG:					
Trawick-------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WeB:					
Woden---------------	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
W:					
Water---------------	100	Not rated		Not rated	

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
AaB:							
Alazan	90	Fair		Poor		Fair	
		Too acid	0.50	Low strength	0.00	Wetness depth	0.53
		Organic matter content low	0.75	Wetness depth	0.53		
		Water erosion	0.99	Shrink-swell	0.96		
AbA:							
Alazan	45	Fair		Poor		Fair	
		Too acid	0.50	Low strength	0.00	Wetness depth	0.53
		Organic matter content low	0.60	Wetness depth	0.53	Too acid	0.88
		Water erosion	0.99				
Besner	40	Fair		Good		Good	
		Too acid	0.68				
		Organic matter content low	0.88				
AtA:							
Alto	85	Fair		Poor		Fair	
		Organic matter content low	0.18	Low strength	0.00	Too clayey	0.19
		Too clayey	0.32	Shrink-swell	0.87		
		Too acid	0.84				
AtB:							
Attoyac	85	Fair		Fair		Fair	
		Too acid	0.54	Low strength	0.78	Too acid	0.98
		Organic matter content low	0.88				
AuD:							
Austonio	80	Fair		Poor		Fair	
		Too acid	0.54	Low strength	0.00	Slope	0.84
		Organic matter content low	0.60	Shrink-swell	0.93	Too acid	0.98
BaB:							
Bernaldo	90	Fair		Fair		Good	
		Organic matter content low	0.60				
		Too acid	0.68				
BeA:							
Besner	85	Fair		Good		Good	
		Too acid	0.68				
		Organic matter content low	0.88				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
BfA:							
Betis	95	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.05
		Too sandy	0.05			Too acid	0.98
		Too acid	0.54				
		Organic matter content low	0.60				
BoC:							
Bowie	80	Fair		Good		Fair	
		Too acid	0.50			Rock fragments	0.88
		Organic matter content low	0.60			Too acid	0.88
BuB:							
Bub	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Low strength	0.00	Too clayey	0.00
		Too clayey	0.00	Shrink-swell	0.87		
		Organic matter content low	0.60				
		Too acid	0.68				
ChA:							
Chireno	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.12		
CoB:							
Corrigan	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.50	Depth to bedrock	0.00	Wetness depth	0.29
		Droughty	0.55	Wetness depth	0.29	Too acid	0.59
		Depth to bedrock	0.71	Shrink-swell	0.40	Depth to bedrock	0.71
		Organic matter content low	0.88				
CrG:							
Cuthbert	75	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.50	Shrink-swell	0.87	Too acid	0.59
		Organic matter content low	0.60			Slope	0.84
						Rock fragments	0.97
CtE:							
Cuthbert	75	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.87	Too clayey	0.00
		Organic matter content low	0.18			Too acid	0.59
		Too acid	0.50			Slope	0.84
						Rock fragments	0.97

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
CtG:							
Cuthbert	85	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.18	Shrink-swell	0.87	Too clayey	0.00
		Too acid	0.50			Too acid	0.59
						Rock fragments	0.97
CtS:							
Cuthbert	85	Poor		Poor		Poor	
		Too clayey	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50	Shrink-swell	0.87	Too clayey	0.00
		Organic matter content low	0.88			Too acid	0.59
						Rock fragments	0.97
CuE:							
Cuthbert	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.50	Shrink-swell	0.87	Too acid	0.59
		Organic matter content low	0.60			Slope	0.84
						Rock fragments	0.97
DaC:							
Darco	80	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.09
		Too sandy	0.09				
		Too acid	0.68				
		Organic matter content low	0.88				
DaE:							
Darco	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.09
		Too sandy	0.09			Slope	0.37
		Too acid	0.68				
		Organic matter content low	0.88				
DsA:							
Dreka	75	Fair		Poor		Fair	
		Organic matter content low	0.88	Low strength	0.00	Wetness depth	0.14
		Too clayey	0.95	Wetness depth	0.14	Too clayey	0.69
		Water erosion	0.99	Shrink-swell	0.66		
EeB:							
Eastwood	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.12	Shrink-swell	0.17	Too acid	0.59
		Water erosion	0.37				
		Organic matter content low	0.88				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
EeD:							
Eastwood------------	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.12	Shrink-swell	0.28	Too acid	0.59
		Water erosion	0.37			Slope	0.84
		Organic matter content low	0.88				
ElA:							
Eastwood------------	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.12	Shrink-swell	0.34	Too acid	0.59
		Water erosion	0.68				
		Organic matter content low	0.88				
Latex---------------	35	Fair		Poor		Fair	
		Too acid	0.50	Low strength	0.00	Too acid	0.88
		Organic matter content low	0.60	Shrink-swell	0.66		
		Water erosion	0.99				
EtB:							
Etoile--------------	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.68	Shrink-swell	0.12		
		Too acid	0.74				
		Water erosion	0.90				
EtD:							
Etoile--------------	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.68	Shrink-swell	0.12	Slope	0.84
		Too acid	0.74				
		Water erosion	0.90				
GaA:							
Gallime-------------	47	Fair		Fair		Good	
		Too acid	0.54	Low strength	0.78		
		Organic matter content low	0.60	Shrink-swell	0.98		
Alazan--------------	35	Fair		Poor		Fair	
		Organic matter content low	0.60	Low strength	0.00	Wetness depth	0.53
		Too acid	0.68	Wetness depth	0.53	Too clayey	0.66
		Too clayey	0.99				
GaB:							
Gallime-------------	85	Fair		Fair		Fair	
		Too acid	0.54	Low strength	0.78	Too acid	0.98
		Organic matter content low	0.60	Shrink-swell	0.96		

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
GaC:							
Gallime	48	Fair		Good		Good	
		Organic matter content low	0.60				
		Too acid	0.84				
Guyton	39	Poor		Poor		Poor	
		Too acid	0.00	Wetness depth	0.00	Wetness depth	0.00
		Organic matter content low	0.12			Too acid	0.12
		Water erosion	0.90			Too clayey	0.58
		Too clayey	0.99				
GrB:							
Grapeland	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.09
		Too sandy	0.09			Too acid	0.50
		Organic matter content low	0.18				
		Too acid	0.50				
GtA:							
Guyton	95	Fair		Poor		Poor	
		Too acid	0.54	Wetness depth	0.00	Wetness depth	0.00
		Organic matter content low	0.88	Low strength	0.00	Too acid	0.98
		Water erosion	0.90				
GuA:							
Guyton	45	Fair		Poor		Poor	
		Too acid	0.50	Wetness depth	0.00	Wetness depth	0.00
		Organic matter content low	0.88			Too acid	0.88
		Water erosion	0.90				
Sawtown	40	Fair		Poor		Fair	
		Too acid	0.20	Low strength	0.00	Too acid	0.98
		Organic matter content low	0.88	Shrink-swell	0.84		
		Water erosion	0.99				
HaA:							
Hainesville	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.50
		Too sandy	0.50			Too acid	0.98
		Too acid	0.54				
		Organic matter content low	0.88				
Hc:							
Hannahatchee	90	Fair		Good		Good	
		Organic matter content low	0.88				
		Too acid	0.97				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HeB:							
Herty	80	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Wetness depth	0.00
		Too acid	0.08	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.18	Shrink-swell	0.12	Sodium content	0.22
		Sodium content	0.22	Depth to bedrock	0.58	Too acid	0.50
		Water erosion	0.90				
Ia:							
Iulus	90	Fair		Fair		Fair	
		Too acid	0.54	Wetness depth	0.98	Wetness depth	0.98
		Organic matter content low	0.60			Too acid	0.98
		Water erosion	0.99			Too sandy	0.99
		Too sandy	0.99				
Iu:							
Iulus	90	Fair		Fair		Fair	
		Too acid	0.54	Wetness depth	0.98	Wetness depth	0.98
		Organic matter content low	0.60			Too acid	0.98
		Water erosion	0.99			Too sandy	0.99
		Too sandy	0.99				
KhB:							
Kirvin	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.08	Shrink-swell	0.92	Too acid	0.50
		Organic matter content low	0.60				
KiC:							
Kirvin	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.03	Shrink-swell	0.87	Too acid	0.59
		Organic matter content low	0.60				
KiD:							
Kirvin	90	Fair		Poor		Fair	
		Too acid	0.03	Low strength	0.00	Too clayey	0.08
		Too clayey	0.12	Shrink-swell	0.87	Too acid	0.32
		Organic matter content low	0.60				
KkD:							
Kisatchie	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Droughty	0.07	Depth to bedrock	0.00	Depth to bedrock	0.10
		Depth to bedrock	0.10	Shrink-swell	0.12	Too acid	0.32
		Too acid	0.50			Slope	0.84
		Organic matter content low	0.88				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KuB:							
Kurth	85	Fair		Fair		Good	
		Organic matter content low	0.60	Shrink-swell	0.98		
		Too acid	0.74				
KwA:							
Kawah	90	Poor		Fair		Poor	
		Too sandy	0.00	Wetness depth	0.76	Too sandy	0.00
		Wind erosion	0.00			Wetness depth	0.76
		Too acid	0.50				
		Organic matter content low	0.60				
		Droughty	0.72				
La:							
Laneville	90	Fair		Poor		Fair	
		Too acid	0.12	Low strength	0.00	Too acid	0.59
		Organic matter content low	0.60	Shrink-swell	0.69	Too clayey	0.64
		Too clayey	0.95	Wetness depth	0.76	Wetness depth	0.76
		Water erosion	0.99				
LaB:							
LaCerda	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.18	Shrink-swell	0.12		
		Too acid	0.54				
LaE:							
LaCerda	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.18	Shrink-swell	0.12	Slope	0.84
		Too acid	0.54				
Lb:							
Laneville	90	Fair		Poor		Fair	
		Too acid	0.50	Low strength	0.00	Wetness depth	0.76
		Organic matter content low	0.60	Shrink-swell	0.75		
		Water erosion	0.99	Wetness depth	0.76		
LdB:							
Latex	87	Fair		Fair		Fair	
		Too acid	0.32	Low strength	0.78	Too acid	0.88
		Organic matter content low	0.60	Shrink-swell	0.84		
		Water erosion	0.99				
LiB:							
Letney	70	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.30
		Organic matter content low	0.18			Too acid	0.98
		Too sandy	0.30				
		Too acid	0.54				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
LiC:							
Lilbert	80	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.09
		Too sandy	0.09				
		Too acid	0.46				
		Organic matter content low	0.68				
LiD:							
Letney	70	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.30
		Organic matter content low	0.18			Slope	0.84
		Too sandy	0.30			Too acid	0.98
		Too acid	0.54				
LnB:							
Lovelady	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.36
		Too sandy	0.36			Too acid	0.98
		Too acid	0.54				
		Organic matter content low	0.60				
LnD:							
Lovelady	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.36
		Too sandy	0.36			Too acid	0.98
		Too acid	0.54				
		Organic matter content low	0.60				
MaE:							
Maben	90	Poor		Fair		Fair	
		Organic matter content low	0.00			Too clayey	0.04
		Too clayey	0.08			Slope	0.84
		Too acid	0.50			Too acid	0.98
		Water erosion	0.99				
MaG:							
Maben	90	Poor		Poor		Poor	
		Organic matter content low	0.00	Slope	0.00	Slope	0.00
		Too clayey	0.00			Too clayey	0.00
		Too acid	0.54			Too acid	0.98
		Droughty	0.68				
Mf:							
Mattex	75	Fair		Poor		Fair	
		Too acid	0.50	Low strength	0.00	Wetness depth	0.29
		Organic matter content low	0.60	Wetness depth	0.29	Too acid	0.50

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MhC:							
Meth	80	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.98	Too clayey	0.00
		Organic matter content low	0.12			Too acid	0.98
		Too acid	0.54				
Mi:							
Mattex	60	Fair		Poor		Fair	
		Too acid	0.50	Low strength	0.00	Wetness depth	0.29
		Organic matter content low	0.60	Wetness depth	0.29	Too acid	0.50
Iulus	30	Fair		Fair		Fair	
		Too acid	0.54	Wetness depth	0.98	Wetness depth	0.98
		Organic matter content low	0.60			Too acid	0.98
		Water erosion	0.99			Too sandy	0.99
		Too sandy	0.99				
MiQ:							
Pits, mine or quarry, gravelly	85	Not rated		Not rated		Not rated	
MiS:							
Metcalf	45	Fair		Poor		Fair	
		Organic matter content low	0.12	Low strength	0.00	Wetness depth	0.53
		Too acid	0.50	Wetness depth	0.53	Too acid	0.76
		Water erosion	0.68	Shrink-swell	0.88		
Sawtown	35	Fair		Poor		Fair	
		Too acid	0.20	Low strength	0.00	Too acid	0.98
		Organic matter content low	0.88	Shrink-swell	0.95		
		Water erosion	0.99				
MpA:							
Mollville	45	Fair		Poor		Poor	
		Organic matter content low	0.12	Wetness depth	0.00	Wetness depth	0.00
		Too acid	0.54	Low strength	0.78	Sodium content	0.90
		Sodium content	0.90	Shrink-swell	0.87	Too acid	0.98
		Water erosion	0.99				
Besner	40	Fair		Good		Good	
		Too acid	0.68				
		Organic matter content low	0.88				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MsB:							
Moswell	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.08	Shrink-swell	0.12	Too acid	0.50
		Sodium content	0.60			Sodium content	0.60
		Organic matter content low	0.68			Salinity	0.88
		Water erosion	0.99				
MsD:							
Moswell	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.08	Shrink-swell	0.00	Too acid	0.50
		Sodium content	0.60			Sodium content	0.60
		Organic matter content low	0.75			Slope	0.84
		Water erosion	0.99			Salinity	0.88
NaB:							
Naclina	93	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.54	Shrink-swell	0.12		
		Organic matter content low	0.75				
NaD:							
Naclina	93	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.75	Shrink-swell	0.12	Slope	0.84
		Too acid	0.92				
NeB:							
Nacogdoches	85	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.10	Too clayey	0.00
		Too acid	0.32	Shrink-swell	0.87	Too acid	0.88
		Organic matter content low	0.60			Rock fragments	0.94
NeE:							
Nacogdoches	90	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.10	Too clayey	0.00
		Too acid	0.32	Shrink-swell	0.87	Too acid	0.88
		Organic matter content low	0.60			Rock fragments	0.94
Ow:							
Owentown	80	Fair		Good		Fair	
		Organic matter content low	0.68			Too sandy	0.98
		Too acid	0.74				
		Too sandy	0.98				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
PeC:							
Penning	50	Fair		Poor		Fair	
		Too acid	0.54	Low strength	0.00	Wetness depth	0.98
		Organic matter content low	0.68	Depth to bedrock	0.58		
		Water erosion	0.99	Wetness depth	0.98		
Kurth	40	Fair		Fair		Fair	
		Organic matter content low	0.60	Shrink-swell	0.99	Too sandy	0.99
		Too acid	0.74				
		Too sandy	0.99				
PoA:							
Pophers	85	Fair		Poor		Fair	
		Too acid	0.08	Low strength	0.00	Wetness depth	0.14
		Organic matter content low	0.68	Wetness depth	0.14	Too acid	0.50
		Sodium content	0.78	Shrink-swell	0.87	Sodium content	0.78
		Water erosion	0.99				
RaD:							
Rayburn	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.08	Shrink-swell	0.12	Too acid	0.50
		Organic matter content low	0.18	Depth to bedrock	0.16	Slope	0.84
		Water erosion	0.90				
RkB:							
Raylake	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.32	Shrink-swell	0.00	Too acid	0.98
		Organic matter content low	0.75				
RkD:							
Raylake	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.03	Shrink-swell	0.00	Slope	0.84
		Organic matter content low	0.75				
RnB:							
Rentzel	75	Poor		Fair		Fair	
		Wind erosion	0.00	Wetness depth	0.76	Too sandy	0.03
		Too sandy	0.03			Wetness depth	0.76
		Too acid	0.50			Too acid	0.88
		Organic matter content low	0.60				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RsB:							
Rosenwall	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.29
		Depth to bedrock	0.29	Shrink-swell	0.23	Too acid	0.98
		Too acid	0.50				
		Organic matter content low	0.88				
RsD:							
Rosenwall	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.29
		Too acid	0.20	Shrink-swell	0.12	Slope	0.84
		Depth to bedrock	0.29			Too acid	0.98
		Organic matter content low	0.88				
SaB:							
Sacul	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.18	Shrink-swell	0.89	Too acid	0.98
		Too acid	0.54				
SeB:							
Sawlit	80	Fair		Poor		Fair	
		Too acid	0.54	Low strength	0.00	Wetness depth	0.98
		Organic matter content low	0.75	Shrink-swell	0.87	Too acid	0.98
		Water erosion	0.99	Wetness depth	0.98		
SfA:							
Sawtown	85	Fair		Poor		Fair	
		Too acid	0.20	Low strength	0.00	Too acid	0.98
		Organic matter content low	0.88	Shrink-swell	0.98		
		Water erosion	0.99				
SmB:							
Smithdale	90	Fair		Good		Fair	
		Organic matter content low	0.12			Too acid	0.98
		Too acid	0.54				
TeD:							
Tehran	86	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.30
		Too sandy	0.30			Slope	0.84
		Too acid	0.54			Too acid	0.98
		Organic matter content low	0.88				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
TnB:							
Tenaha	90	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.09
		Too acid	0.08			Too acid	0.98
		Too sandy	0.09			Rock fragments	0.99
		Organic matter content low	0.18				
TnD:							
Tenaha	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.09
		Too acid	0.08			Slope	0.84
		Too sandy	0.09			Too acid	0.98
		Organic matter content low	0.18			Rock fragments	0.99
TnG:							
Tenaha	80	Poor		Poor		Poor	
		Wind erosion	0.00	Slope	0.00	Slope	0.00
		Too acid	0.08			Too acid	0.50
		Organic matter content low	0.18				
TsB:							
Tonkawa	85	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Too acid	0.50
		Too acid	0.50				
		Organic matter content low	0.60				
		Droughty	0.72				
TsD:							
Tonkawa	85	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.37
		Too acid	0.50			Too acid	0.50
		Organic matter content low	0.60				
		Droughty	0.72				
Tu:							
Tuscosso	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.54	Shrink-swell	0.12	Too acid	0.98
TuD:							
Trawick	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.18	Depth to bedrock	0.00	Slope	0.84
		Droughty	0.95	Shrink-swell	0.87	Rock fragments	0.94
		Too acid	0.97				

Table 25.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuG:							
Trawick-------------	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Organic matter content low	0.18	Depth to bedrock	0.00	Too clayey	0.00
		Droughty	0.87	Slope	0.50	Rock fragments	0.94
		Too acid	0.97	Shrink-swell	0.94		
WeB:							
Woden---------------	80	Fair		Good		Fair	
		Organic matter content low	0.60			Too sandy	0.99
		Too acid	0.84				
		Too sandy	0.99				
W:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 26.--Ponds and Embankments

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
AaB:							
Alazan	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Slow refill	0.30
				Depth to saturated zone	0.99	Cutbanks cave	0.10
						Depth to saturated zone	0.01
AbA:							
Alazan	45	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Slow refill	0.30
				Depth to saturated zone	0.99	Cutbanks cave	0.10
						Depth to saturated zone	0.01
Besner	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
						Slow refill	0.30
AtA:							
Alto	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Depth to saturated zone	0.24	Depth to water	1.00
				Piping	0.16		
AtB:							
Attoyac	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
AuD:							
Austonio	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.62	Depth to water	1.00
		Slope	1.00				
BaB:							
Bernaldo	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
BeA:							
Besner	85	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
						Slow refill	0.30
BfA:							
Betis	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.75	Depth to water	1.00
		Slope	0.08				
BoC:							
Bowie	80	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00

Table 26.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BuB:							
Bub	80	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Seepage	1.00	Depth to water	1.00
		Slope	0.02	Thin layer	1.00		
				Piping	1.00		
ChA:							
Chireno	95	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.03			Slow refill	0.97
						Depth to saturated zone	0.90
						Cutbanks cave	0.10
CoB:							
Corrigan	85	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.08	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.02	Seepage	1.00		
				Piping	1.00		
				Thin layer	0.81		
CrG:							
Cuthbert	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.98	Depth to water	1.00
		Seepage	0.03				
CtE:							
Cuthbert	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.88	Depth to water	1.00
		Seepage	0.03				
CtG:							
Cuthbert	85	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.97	Depth to water	1.00
		Seepage	0.03				
CtS:							
Cuthbert	85	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.90	Depth to water	1.00
		Seepage	0.03				
CuE:							
Cuthbert	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.83	Depth to water	1.00
		Seepage	0.03				
DaC:							
Darco	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.75	Depth to water	1.00
		Slope	0.32				
DaE:							
Darco	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.46	Depth to water	1.00
		Slope	1.00				

Table 26.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DsA:							
Dreka	75	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.03	Depth to saturated zone	1.00	Slow refill	0.97
				Piping	0.62	Cutbanks cave	0.10
EeB:							
Eastwood	95	Not limited		Not limited		Very limited	
						Depth to water	1.00
EeD:							
Eastwood	95	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
ElA:							
Eastwood	50	Not limited		Somewhat limited		Very limited	
				Piping	0.01	Depth to water	1.00
Latex	35	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
				Depth to saturated zone	0.02		
EtB:							
Etoile	95	Not limited		Not limited		Very limited	
						Depth to water	1.00
EtD:							
Etoile	95	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
GaA:							
Gallime	47	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
Alazan	35	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Slow refill	0.30
				Depth to saturated zone	0.99	Cutbanks cave	0.10
						Depth to saturated zone	0.01
GaB:							
Gallime	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
GaC:							
Gallime	48	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
Guyton	39	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		

Table 26.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
GrB:							
Grapeland	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.50	Depth to water	1.00
GtA:							
Guyton	95	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		
GuA:							
Guyton	45	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		
Sawtown	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
HaA:							
Hainesville	85	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
Hc:							
Hannahatchee	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
HeB:							
Herty	80	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.01	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	0.90		
				Thin layer	0.11		
Ia:							
Iulus	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
				Depth to saturated zone	0.68		
Iu:							
Iulus	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
				Depth to saturated zone	0.68		
KhB:							
Kirvin	85	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
KiC:							
Kirvin	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Piping	0.20	Depth to water	1.00
KiD:							
Kirvin	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.32	Piping	0.01	Depth to water	1.00
		Seepage	0.03				

Table 26.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KkD:							
Kisatchie	90	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Depth to bedrock	0.30	Piping	1.00		
		Seepage	0.02	Thin layer	0.98		
KuB:							
Kurth	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
KwA:							
Kawah	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Cutbanks cave	1.00
				Depth to saturated zone	0.95	Depth to saturated zone	0.02
La:							
Laneville	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Depth to saturated zone	0.95	Depth to water	1.00
				Piping	0.92		
LaB:							
LaCerda	90	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.78	Depth to water	1.00
LaE:							
LaCerda	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Hard to pack	0.55	Depth to water	1.00
Lb:							
Laneville	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Depth to saturated zone	0.95	Depth to water	1.00
				Piping	0.94		
LdB:							
Latex	87	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.98	Depth to water	1.00
				Depth to saturated zone	0.02		
LiB:							
Letney	70	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
LiC:							
Lilbert	80	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
LiD:							
Letney	70	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				

Table 26.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LnB:							
Lovelady	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.43	Depth to water	1.00
LnD:							
Lovelady	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.43	Depth to water	1.00
		Slope	0.92	Seepage	0.37		
MaE:							
Maben	90	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.53				
MaG:							
Maben	90	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.53				
Mf:							
Mattex	75	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	0.97		
MhC:							
Meth	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.91	Depth to water	1.00
Mi:							
Mattex	60	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	0.97		
Iulus	30	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
				Depth to saturated zone	0.68		
MiQ:							
Pits, mine or quarry, gravelly	85	Very limited		Not rated		Not rated	
		Not rated	1.00				
		Seepage	1.00				
MiS:							
Metcalf	45	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Piping	1.00	Depth to water	1.00
				Depth to saturated zone	0.99		
Sawtown	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
				Depth to saturated zone	0.02		

Table 26.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MpA:							
Mollville-----------	45	Not limited		Very limited		Somewhat limited	
				Ponding	1.00	Cutbanks cave	0.10
				Depth to saturated zone	1.00		
				Piping	0.74		
Besner--------------	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
						Slow refill	0.30
MsB:							
Moswell-------------	85	Not limited		Somewhat limited		Very limited	
				Piping	0.40	Depth to water	1.00
MsD:							
Moswell-------------	90	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.40	Depth to water	1.00
NaB:							
Naclina-------------	93	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.99	Depth to water	1.00
NaD:							
Naclina-------------	93	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Hard to pack	0.99	Depth to water	1.00
NeB:							
Nacogdoches---------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.32	Piping	0.38	Depth to water	1.00
		Seepage	0.03				
NeE:							
Nacogdoches---------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Piping	0.01	Depth to water	1.00
Ow:							
Owentown------------	80	Very limited		Somewhat limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	0.24	Depth to saturated zone	0.38
						Cutbanks cave	0.10
PeC:							
Penning-------------	50	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
		Depth to bedrock	0.01	Depth to saturated zone	0.68		
Kurth---------------	40	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.99	Depth to water	1.00
PoA:							
Pophers-------------	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.03	Depth to saturated zone	1.00	Slow refill	0.97
				Piping	0.81	Cutbanks cave	0.10

Table 26.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RaD:							
Rayburn	85	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Hard to pack	0.69	Depth to water	1.00
		Seepage	0.02	Thin layer	0.26		
		Depth to bedrock	0.01	Depth to saturated zone	0.09		
RkB:							
Raylake	85	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.97	Depth to water	1.00
RkD:							
Raylake	95	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Hard to pack	0.95	Depth to water	1.00
RnB:							
Rentzel	75	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.95	Depth to water	1.00
				Seepage	0.25		
RsB:							
Rosenwall	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.19	Thin layer	0.93	Depth to water	1.00
		Seepage	0.02	Hard to pack	0.26		
RsD:							
Rosenwall	90	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Depth to bedrock	0.19	Thin layer	0.93		
		Seepage	0.02				
SaB:							
Sacul	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Depth to saturated zone	0.43	Depth to water	1.00
				Piping	0.02		
SeB:							
Sawlit	80	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
				Depth to saturated zone	0.68		
SfA:							
Sawtown	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
SmB:							
Smithdale	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
TeD:							
Tehran	86	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.75	Depth to water	1.00
		Slope	1.00				

Table 26.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TnB:							
Tenaha	90	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
TnD:							
Tenaha	85	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
TnG:							
Tenaha	80	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
TsB:							
Tonkawa	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	0.08				
TsD:							
Tonkawa	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00				
Tu:							
Tuscosso	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.03	Depth to saturated zone	0.43	Slow refill	0.97
				Piping	0.01	Depth to saturated zone	0.25
						Cutbanks cave	0.10
TuD:							
Trawick	80	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.46	Depth to water	1.00
		Seepage	0.53	Piping	0.04		
		Depth to bedrock	0.01				
TuG:							
Trawick	80	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.46	Depth to water	1.00
		Seepage	0.53				
		Depth to bedrock	0.01				
WeB:							
Woden	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
W:							
Water	100	Not rated		Not rated		Not rated	

Table 27.--Engineering Properties

(Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AaB:												
Alazan----------	0-3	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	3-12	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	12-20	*Loam, Sandy clay loam	*CL	*A-6, A-4	0	0	100	96-100	90-100	51-85	25-40	8-22
	20-26	*Clay loam, Sandy clay loam, loam	*CL	*A-6, A-4, A-7-6	0	0	96-100	95-100	85-100	65-90	31-47	10-25
	26-80	*Clay loam, Sandy clay loam, loam	*CL	*A-6, A-4, A-7-6	0	0	96-100	95-100	85-100	65-90	31-47	10-25
AbA:												
Alazan----------	0-5	*Very fine sandy loam	*ML, CL-ML	*A-4,	0	0	100	96-100	90-100	51-80	0-25	NP-7
	5-11	*Very fine sandy loam	*ML, CL-ML	*A-4,	0	0	100	96-100	90-100	51-80	0-25	NP-7
	11-37	*Sandy clay loam, Loam	*CL	*A-6, A-4	0	0	100	96-100	90-100	51-85	25-40	8-22
	37-80	*Sandy clay loam, Loam	*CL	*A-6, A-4	0	0	100	96-100	90-100	51-85	25-40	8-22
Besner----------	0-24	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	24-53	*Fine sandy loam, Loam	*SM, ML, SC-SM, CL-ML	*A-4, A-2-4	0	0	100	95-100	80-100	29-66	0-25	NP-7
	53-80	*Loam, Sandy clay loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	100	95-100	80-100	36-75	18-30	6-15
AtA:												
Alto------------	0-7	*Clay loam	*CL, CL-ML, SC, SC-SM	*A-4, A-6	0	0	90-100	85-100	65-95	36-65	25-35	6-12
	7-41	*Clay loam, Sandy clay, clay	*CL, SC	*A-6, A-7, A-7-6	0	0	95-100	85-95	80-95	42-70	30-45	15-30
	41-58	*Clay loam, Loam, sandy clay loam	*CL, SC	*A-6, A-7, A-7-6	0	0-4	95-100	75-95	60-85	42-65	32-45	15-25
	58-80	*Clay	*SC, CH, CL	*A-7-6, A-6	0	0-4	90-100	65-90	60-90	30-60	30-51	15-30

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AtB:												
Attoyac---------	0-5	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	98-100	95-100	70-100	40-65	0-23	NP-7
	5-10	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	98-100	95-100	70-100	40-65	0-23	NP-7
	10-80	*Sandy clay loam, Fine sandy loam, loam	*CL, SC, SC-SM	*A-6, A-4	0	0	98-100	95-100	80-100	45-75	23-40	7-24
AuD:												
Austonio--------	0-8	*Fine sandy loam	*SC-SM, CL, ML, SC, SM	*A-4	0	0	90-100	90-100	85-95	36-55	20-28	3-10
	8-16	*Fine sandy loam	*SC-SM, CL, ML, SC, SM	*A-4	0	0	90-100	90-100	85-95	36-55	20-28	3-10
	16-70	*Sandy clay loam, Loam	*CL,	*A-6	0	0	100	95-100	90-100	51-75	26-40	12-24
	70-80	*Fine sandy loamy, loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	95-100	95-100	85-100	15-45	0-25	NP-5
BaB:												
Bernaldo--------	0-5	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	5-15	*Fine sandy loam, Very fine sandy loam, loam	*ML, CL-ML, SM	*A-4	0	0	100	95-100	90-100	40-70	0-25	NP-5
	15-41	*Sandy clay loam, Loam, clay loam	*CL	*A-6	0	0	99-100	98-100	90-100	51-75	26-40	12-24
	41-80	*Loam, Fine sandy loam, sandy clay loam	*SC, CL, ML, SM	*A-6, A-2-4, A-4	0	0	100	95-100	90-100	28-65	20-40	3-22
BeA:												
Besner----------	0-6	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	6-25	*Fine sandy loam, Very fine sandy loam, loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	25-62	*Fine sandy loam, loam	*SM, SC-SM, CL-ML, ML	*A-4, A-2-4	0	0	100	95-100	80-100	29-66	0-25	NP-7
	62-80	*Loam, Sandy clay loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	100	95-100	80-100	36-75	18-30	6-15
BfA:												
Betis-----------	0-7	*Loamy fine sand	*SM, SP-SM	*A-2-4, A-2, A-3	0	0	100	97-100	90-100	10-35	0-14	NP
	7-28	*Loamy fine sand, Fine sand	*SM, SP-SM	*A-2-4, A-3, A-2	0	0	100	97-100	90-100	10-35	0-14	NP
	28-80	*Loamy fine sand, Fine sand	*SM	*A-4, A-2, A-2-4	0	0	100	97-100	90-100	25-50	16-28	NP

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BoC:												
Bowie-----------	0-9	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	97-100	94-100	90-100	30-55	0-25	NP-6
	9-17	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	97-100	94-100	90-100	30-55	0-25	NP-6
	17-25	*Sandy clay loam, Clay loam, fine sandy loam	*CL, SC	*A-6, A-4	0	0	90-100	87-100	80-100	40-72	20-40	8-25
	25-80	*Sandy clay loam, Clay loam, fine sandy loam	*CL, SC	*A-6, A-2-4, A-4	0	0	80-100	70-100	65-100	34-77	20-40	8-25
BuB:												
Bub-------------	0-4	*Clay loam	*SC-SM, CL, CL-ML, SC	*A-4, A-2-4	0	0	90-100	90-100	85-95	25-55	20-30	4-10
	4-18	*Clay, Sandy clay, clay loam	*CH, CL, MH, ML	*A-7-6,	0	0	95-100	85-100	85-99	51-75	41-60	15-30
	18-80	*Bedrock			---	---	---	---	---	---	---	---
ChA:												
Chireno---------	0-7	*Clay loam	*CL	*A-6	0	0	99-100	90-100	90-97	51-85	32-46	14-25
	7-33	*Clay, Clay loam, sandy clay loam	*CH, CL	*A-7-6, A-7	0	0	95-100	85-95	65-95	51-85	44-60	23-36
	33-50	*Clay, Clay loam	*CH, CL	*A-7-6, A-7	0	0	95-100	85-95	65-95	51-85	44-60	23-36
	50-80	*Clay, Clay loam, sandy clay loam	*CH, CL	*A-7-6, A-7	0	0	95-100	85-95	65-95	51-85	44-60	23-36
CoB:												
Corrigan--------	0-6	*Fine sandy loam	*SC-SM, CL-ML, ML, SM	*A-4	0	0	100	100	70-100	36-55	21-30	2-7
	6-14	*Fine sandy loam	*SC-SM, CL-ML, ML, SM	*A-4	0	0	100	100	70-100	36-55	21-30	2-7
	14-39	*Clay, Silty clay	*CH	*A-7-6	0	0	100	100	90-100	65-95	52-76	30-50
	39-80	*Bedrock			0	0	---	---	---	---	---	---
CrG:												
Cuthbert--------	0-2	*Gravelly clay loam	*SC-SM, SM, CL, SC	*A-6, A-2-4, A-4	0	1-5	70-80	65-80	60-70	20-50	20-30	2-11
	2-22	*Clay, Sandy clay loam, sandy clay, clay loam	*CH, CL, SC	*A-7-6, A-6	0	0-1	85-100	75-100	65-100	45-98	37-64	20-40
	22-80	*Stratified fine sandy loam to clay	*CL, CH, SC	*A-6, A-4, A-7	0	0-1	95-100	90-100	50-90	36-80	25-52	9-32

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
CtE:												
Cuthbert--------	0-6	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0-1	85-100	78-100	75-98	20-55	0-32	NP-7
	6-10	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0-1	85-100	78-100	75-98	20-55	0-32	NP-7
	10-37	*Clay, Sandy clay loam, sandy clay	*CH, CL, SC	*A-7-6, A-6	0	0-1	85-100	75-100	65-100	45-98	37-64	19-40
	37-80	*Clay, Sandy clay loam	*CL, SC, SC-SM	*A-6, A-2-6, A-7, A-7-6	0	0-3	85-100	80-100	75-100	28-84	21-45	7-26
CtG:												
Cuthbert--------	0-6	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-2-4, A-4	0	0-1	85-100	78-100	75-98	20-55	0-32	NP-7
	6-10	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-2-4, A-4	0	0-1	85-100	78-100	75-98	20-55	0-32	NP-7
	10-33	*Clay, Sandy clay loam, sandy clay	*CH, CL, SC	*A-7-6, A-6	0	0-1	85-100	75-100	65-100	45-98	37-64	19-40
	33-80	*Clay loam, Fine sandy loam, sandy clay loam	*CL, SC	*A-6, A-2-4, A-7, A-7-6	0	0-1	85-100	80-100	75-100	28-84	29-45	10-26
CtS:												
Cuthbert--------	0-3	*Stony fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4,	0-1	0-5	90-100	85-100	75-98	36-60	0-30	NP-6
	3-30	*Clay, Sandy clay loam	*CL, SC, CH	*A-7-6, A-6, A-7	0	0-5	85-100	75-100	65-100	45-98	37-63	20-40
	30-80	*Sandy clay loam	*CL, SC	*A-6, A-2-4, A-7, A-7-6	0	0-5	85-100	80-100	75-100	28-84	21-45	7-26
CuE:												
Cuthbert--------	0-6	*Gravelly fine sandy loam	*SM, GC-GM, GM, SC-SM	*A-2-4, A-1-b, A-4	0-1	0-5	60-88	50-80	35-75	20-49	0-32	NP-7
	6-31	*Clay, Sandy clay loam, sandy clay	*CH, CL, SC	*A-7-6, A-6	0	0-1	85-100	75-100	65-100	45-98	37-64	19-40
	31-37	*Clay loam, Fine sandy loam, sandy clay loam	*CL, SC	*A-6, A-2-6, A-7, A-7-6	0	0-1	85-100	80-100	75-100	28-84	29-45	11-26
	37-80	*Sandy clay loam	*CL, CH, SC	*A-6, A-4, A-7, A-7-6	0	0-1	95-100	90-100	50-90	36-80	25-52	9-32
DaC:												
Darco-----------	0-9	*Loamy fine sand	*SM	*A-2-4,	0	0-2	95-100	95-100	75-100	15-30	16-20	NP-3
	9-70	*Loamy fine sand, Fine sand	*SM	*A-2-4,	0	0-2	95-100	95-100	75-100	15-30	16-20	NP-3
	70-80	*Fine sandy loam, Sandy clay loam	*SC, SC-SM	*A-6, A-2-4, A-4	0	0	95-100	95-100	75-100	23-50	20-40	5-18

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
DaE:												
Darco-----------	0-6	*Loamy fine sand	*SM	*A-2-4,	0	0-2	95-100	95-100	75-100	15-30	16-20	NP-3
	6-49	*Loamy fine sand, Fine sand	*SM	*A-2-4,	0	0-2	95-100	95-100	75-100	15-30	16-20	NP-3
	49-61	*Sandy clay loam, Fine sandy loam	*SC, CL	*A-6, A-2-4, A-7-6	0	0	95-100	95-100	80-100	23-55	25-45	9-28
	61-80	*Sandy clay loam, Fine sandy loam	*SC, SC-SM	*A-6, A-2-4, A-4	0	0	95-100	95-100	75-100	23-50	20-40	5-18
DsA:												
Dreka-----------	0-9	*Loam	*CL, CL-ML	*A-6, A-4	0	0	100	95-100	90-100	70-90	20-40	6-21
	9-43	*Clay loam, silty clay loam, loam	*CL, CL-ML	*A-6, A-4, A-7, A-7-6	0	0	100	95-100	90-100	70-95	20-44	6-25
	43-80	*Clay, Clay loam, silty clay	*CL, CH	*A-7-6, A-6, A-7	0	0	100	95-100	90-100	75-98	35-55	20-35
EeB:												
Eastwood--------	0-7	*Very fine sandy loam	*CL-ML, ML, SC-SM, SM	*A-4, A-6	0	0	98-100	95-100	85-100	45-65	20-33	3-13
	7-10	*Very fine sandy loam	*CL-ML, ML, SC-SM, SM	*A-4, A-6	0	0	98-100	95-100	85-100	45-65	20-33	3-13
	10-19	*Clay, Silty clay	*CH, CL	*A-7-6, A-6	0	0	100	95-100	90-100	70-98	40-75	25-48
	19-55	*Clay, Silty clay	*CH, CL	*A-7-6, A-6	0	0	100	95-100	90-100	70-98	40-75	25-48
	55-80	*Sandy clay loam, clay loam	*CL, SC	*A-6	0	0	95-100	95-100	90-100	40-98	25-68	5-44
EeD:												
Eastwood--------	0-4	*Very fine sandy loam	*CL-ML, ML, SC-SM, SM	*A-4, A-6	0	0	98-100	95-100	85-100	45-65	20-33	3-13
	4-47	*Clay, Silty clay	*CH, CL	*A-7-6, A-6	0	0	100	95-100	90-100	70-98	40-75	25-48
	47-80	*Silty clay loam	*CL, CL-ML, SC, SC-SM	*A-7-6, A-4, A-6	0	0	95-100	95-100	90-100	40-98	25-68	5-44

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
ElA:												
Eastwood--------	0-6	*Very fine sandy loam	*CL-ML, ML, SC-SM, CL, SM	*A-4, A-6	0	0	98-100	98-100	95-100	40-89	20-31	3-12
	6-35	*Clay, Silty clay	*CH, CL	*A-7-6, A-6	0	0	100	95-100	90-100	70-98	40-75	25-48
	35-43	*Clay loam, Silty clay loam, loam	*CL, CH	*A-7-6, A-6	0	0	100	95-100	90-100	55-99	35-65	15-45
	43-80	*Silty clay loam	*CL, CL-ML, SC, SC-SM, CH	*A-7-6, A-4, A-6	0	0	95-100	95-100	90-100	40-98	25-68	5-44
Latex-----------	0-14	*Fine sandy loam	*CL-ML, SC, SC-SM, SM	*A-4,	0	0	99-100	96-100	90-100	45-75	19-30	2-9
	14-31	*Loam, Clay loam, sandy clay loam	*CL, CL-ML	*A-6, A-4	0	0	99-100	95-100	90-100	51-80	20-40	6-25
	31-39	*Clay loam, Loam, sandy clay loam	*CL, SC, SC-SM, CL-ML	*A-6, A-4	0	0-2	75-100	64-98	62-95	41-80	20-40	6-25
	39-80	*Clay, Silty clay, clay loam	*CH, CL	*A-7-6,	0	0	99-100	95-100	90-100	75-98	41-70	20-43
EtB:												
Etoile----------	0-8	*Loam	*ML, CL-ML	*A-4	0	0	98-100	98-100	85-95	51-85	16-30	NP-7
	8-32	*Clay	*CH	*A-7-6	0	0	98-100	98-100	85-100	75-98	51-76	35-50
	32-51	*Clay	*CH	*A-7-6	0	0	98-100	98-100	85-100	75-98	51-76	35-50
	51-80	*Clay, Clay loam	*CH	*A-7-6	0	0	98-100	98-100	80-100	75-98	51-76	35-50
EtD:												
Etoile----------	0-4	*Fine sandy loam, Very fine sandy loam	*SM, CL-ML, ML	*A-4	0	0	98-100	95-100	80-95	40-55	16-30	NP-7
	4-43	*Clay	*CH	*A-7-6	0	0	98-100	98-100	85-100	75-98	51-76	35-50
	43-80	*Clay	*CH	*A-7-6	0	0	98-100	98-100	80-100	75-98	51-76	35-50

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
GaA:												
Gallime	0-4	*Fine sandy loam	*CL-ML, CL, ML, SC, SM	*A-4	0	0	95-100	95-100	90-100	45-65	15-28	3-10
	4-25	*Fine sandy loam, Very fine sandy loam, loam	*CL-ML, CL, ML, SC, SM	*A-4	0	0	95-100	95-100	90-100	45-65	15-28	3-10
	25-80	*Sandy clay loam, Clay loam, loam	*CL, SC	*A-6, A-4	0	0	95-100	95-100	90-100	45-80	25-40	8-20
Alazan	0-3	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	3-12	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	12-80	*Sandy clay loam, Loam	*CL	*A-6, A-4	0	0	100	96-100	90-100	51-85	25-40	8-22
GaB:												
Gallime	0-3	*Very fine sandy loam	*CL-ML, CL, ML, SC, SM	*A-4	0	0	95-100	95-100	90-100	45-65	15-28	3-10
	3-20	*Fine sandy loam, Very fine sandy loam, loam	*CL-ML, CL, ML, SC, SM	*A-4	0	0	95-100	95-100	90-100	45-65	15-28	3-10
	20-80	*Sandy clay loam, Clay loam, loam	*CL, SC	*A-6, A-4	0	0	95-100	95-100	90-100	45-80	25-40	8-20
GaC:												
Gallime	0-27	*Very fine sandy loam, fine sandy loam	*ML, CL-ML, SM	*A-4	0	0	100	95-100	90-100	49-75	15-25	NP-5
	27-45	*Loam, Fine sandy loam, very fine sandy loam	*CL-ML, CL, ML, SC, SM	*A-4	0	0	95-100	95-100	90-100	45-65	15-28	3-10
	45-80	*Sandy clay loam, Clay loam, loam	*CL, SC, CL-ML	*A-6, A-4, A-2-6, A-2-4	0	0	95-100	95-100	90-100	35-80	25-40	8-20
Guyton	0-5	*Silt loam	*ML, CL-ML	*A-4	0	0	100	100	95-100	65-90	0-27	NP-7
	5-11	*Silt loam	*ML, CL-ML	*A-4	0	0	100	100	95-100	65-90	0-27	NP-7
	11-26	*Clay loam, Loam, silt loam	*CL,	*A-6	0	0	100	100	90-100	65-95	27-38	12-19
	26-49	*Clay loam, Loam, silt loam	*CL	*A-6	0	0	100	100	90-100	65-95	27-38	12-19
	49-80	*Sandy clay loam, Silt loam, silty clay loam	*CL, CL-ML, ML	*A-4, A-6	0	0	100	100	95-100	50-95	0-40	NP-18
GrB:												
Grapeland	0-6	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	100	98-100	80-100	15-40	0-25	NP-7
	6-80	*Loamy fine sand, Loamy sand	*SM, SC-SM	*A-2-4, A-4	0	0	100	98-100	80-100	13-45	0-25	NP-7

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
GtA:												
Guyton----------	0-7	*Silt loam	*ML, CL-ML	*A-4	0	0	100	100	95-100	65-90	0-27	NP-7
	7-16	*Silt loam	*ML, CL-ML	*A-4	0	0	100	100	95-100	65-90	0-27	NP-7
	16-80	*Clay loam, Silt loam, silty clay loam	*CL, CL-ML	*A-6, A-4	0	0	100	100	94-100	75-95	26-40	6-18
GuA:												
Guyton----------	0-16	*Silt loam	*ML, CL-ML	*A-4	0	0	100	100	95-100	65-90	0-27	NP-7
	16-32	*Silty clay loam, Silt loam, clay loam	*CL, CL-ML	*A-6, A-4	0	0	100	100	94-100	75-95	22-40	6-18
	32-80	*Silty clay loam, Silt loam, sandy clay loam	*CL, CL-ML, ML	*A-6, A-4	0	0	100	100	95-100	50-95	0-40	NP-18
Sawtown---------	0-24	*Very fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	95-100	95-100	85-100	45-80	0-25	NP-6
	24-42	*Sandy clay loam, Loam, clay loam	*CL, CL-ML	*A-6, A-4	0	0	95-100	95-100	90-100	55-85	24-40	6-22
	42-80	*Clay, Clay loam	*CH, CL	*A-7-6, A-6	0	0	95-100	95-100	90-100	65-95	39-65	20-45
HaA:												
Hainesville-----	0-2	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	100	100	90-100	15-50	0-25	NP-5
	2-7	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	100	100	90-100	15-50	0-25	NP-5
	7-22	*Loamy fine sand, Fine sand	*SM,	*A-2-4, A-4	0	0	100	100	90-100	15-50	0-25	NP-3
	22-80	*Loamy fine sand, Fine sandy loam, fine sand	*SM, ML	*A-4, A-2-4	0	0	100	100	90-100	20-55	0-25	NP-3
Hc:												
Hannahatchee----	0-4	*Loam	*CL-ML, CL, SC-SM	*A-4, A-6	0	0	98-100	96-100	70-90	40-65	16-30	3-11
	4-25	*Loam, sandy clay loam, fine sandy loam	*CL, CL-ML, SC	*A-4, A-6	0	0	98-100	96-100	85-90	45-65	20-31	5-12
	25-80	*Clay loam, sandy clay loam, loam	*CL, CL-ML, SC	*A-6, A-4, A-7, A-7-6	0	0-3	97-100	85-100	85-95	45-75	23-43	7-18
HeB:												
Herty-----------	0-2	*Loam	*CL, CL-ML	*A-4, A-6	0	0	98-100	98-100	95-100	51-90	18-35	4-15
	2-7	*Loam	*CL, CL-ML	*A-4, A-6	0	0	98-100	98-100	95-100	51-90	18-35	4-15
	7-20	*Clay, Clay loam, silty clay loam	*CH, CL	*A-7-6, A-6	0	0	98-100	98-100	95-100	75-95	30-50	15-32
	20-31	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0	98-100	98-100	95-100	75-95	36-53	20-35
	31-45	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0	98-100	98-100	95-100	75-95	36-53	20-35
	45-60	*Clay, Clay loam	*CH	*A-7-6	0	0	95-100	95-100	90-100	65-95	51-75	30-50

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Ia:												
Iulus-----------	0-10	*Fine sandy loam	*ML, CL-ML	*A-4	0	0	95-100	95-100	85-95	51-75	16-25	NP-6
	10-46	*Fine sandy loam, Loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	95-100	85-100	80-95	45-75	16-25	NP-6
	46-80	*Loamy fine sand, Fine sandy loam	*SM, SC-SM, CL-ML, ML	*A-4, A-2-4	0	0	95-100	95-100	70-95	15-68	0-25	NP-6
Iu:												
Iulus-----------	0-8	*Fine sandy loam	*CL-ML, CL	*A-4	0	0	100	95-100	90-100	60-85	20-31	4-10
	8-24	*Fine sandy loam, Loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	95-100	85-100	80-95	45-75	16-25	NP-6
	24-80	*Very fine sandy loam, fine sandy loam	*CL, CL-ML, ML, SC	*A-4, A-6	0	0	95-100	90-100	80-95	45-75	16-32	3-15
KhB:												
Kirvin----------	0-7	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4	0	0	95-100	95-100	70-85	40-55	0-25	NP-7
	7-12	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4	0	0	95-100	95-100	70-85	40-55	0-25	NP-7
	12-40	*Clay, Sandy clay, clay loam	*CH, CL	*A-7-6, A-6	0	0-1	95-100	90-100	85-100	53-95	42-67	24-43
	40-51	*Clay, Clay loam, sandy clay	*CH, CL	*A-7-6, A-6	0	0-1	95-100	90-100	85-100	53-95	42-67	24-43
	51-57	*Sandy clay loam, Clay loam	*SC, CL, CH, ML	*A-6, A-7-6	0	0	85-100	85-100	80-90	36-55	30-50	11-20
	57-80	*Variable			---	---	---	---	---	---	---	---
KiC:												
Kirvin----------	0-7	*Gravelly fine sandy loam	*SM, GC-GM, GM, SC-SM	*A-2-4, A-1-b, A-4	0-1	0-5	60-88	50-80	35-75	20-49	0-32	NP-7
	7-34	*Clay, Clay loam, sandy clay	*CH, CL	*A-7-6, A-7	0	0-1	95-100	90-100	85-100	53-95	42-67	24-43
	34-46	*Clay loam, Sandy clay loam, clay	*CL, CH	*A-7-6, A-6, A-7	0	0-1	95-100	90-100	75-100	51-90	32-59	16-32
	46-80	*Sandy clay loam	*CL, SC	*A-6, A-4	0	0-1	95-100	90-100	50-90	36-80	25-52	9-32
KiD:												
Kirvin----------	0-11	*Sandy clay loam	*SC, CL	*A-6	0	0	85-100	85-100	80-90	36-55	30-40	11-20
	11-40	*Clay loam, Sandy clay loam, clay	*CL, CH	*A-6, A-7-6	0	0-1	95-100	90-100	75-100	51-90	32-52	16-32
	40-80	*Sandy clay loam	*CL, SC	*A-6,	0	0-1	95-100	90-100	50-90	36-80	25-52	9-32

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
KkD:												
Kisatchie-------	0-3	*Loam	*SC-SM, CL-ML, ML, SM	*A-4	0	0	100	100	70-100	36-55	21-30	2-7
	3-5	*Loam, Fine sandy loam	*SC-SM, CL-ML, ML, SM	*A-4	0	0	100	100	70-100	36-55	21-30	2-7
	5-26	*Clay, Silty clay	*CH	*A-7-6	0	0	100	100	90-100	65-95	52-76	30-50
	26-80	*Bedrock			---	---	---	---	---	---	---	---
KuB:												
Kurth-----------	0-8	*Fine sandy loam	*SM, SC-SM	*A-4, A-2-4	0	0	98-100	98-100	85-100	25-50	16-30	NP-7
	8-26	*Fine sandy loam	*SM, SC-SM	*A-4, A-2-4	0	0	98-100	98-100	85-100	25-50	16-30	NP-7
	26-50	*Sandy clay loam, Fine sandy loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	98-100	96-100	85-100	40-80	23-38	7-15
	50-61	*Clay, Clay loam	*CL,	*A-7-6, A-6	0	0	98-100	96-100	85-100	60-90	38-47	15-20
	61-80	*Sandy clay loam, Fine sandy loam, clay loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	98-100	95-100	85-100	40-70	21-34	6-13
KwA:												
Kawah-----------	0-22	*Fine sand	*SM, SP-SM, SC-SM	*A-2-4, A-3, A-1-b	0	0	98-100	95-100	50-80	5-20	0-25	NP-4
	22-80	*Fine sand, Sand	*SM, SP-SM, SC-SM	*A-2-4, A-3, A-1-b	0	0	98-100	95-100	50-80	5-20	0-25	NP-4
La:												
Laneville-------	0-13	*Loam	*CL, CL-ML, ML	*A-6, A-4	0	0	100	95-100	90-100	80-95	18-40	3-20
	13-42	*Silty clay loam, Loam, clay loam	*CL, CL-ML	*A-6, A-4	0	0	100	95-100	90-100	85-98	20-40	6-20
	42-80	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0	0	100	95-100	90-100	85-98	35-55	20-35
LaB:												
LaCerda---------	0-3	*Clay loam	*CL	*A-6	0	0	98-100	96-100	95-100	80-98	30-50	15-30
	3-60	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	85-98	51-70	30-45
	60-80	*Clay	*CH	*A-7-6	0	0	100	100	95-100	80-98	51-70	30-45
LaE:												
LaCerda---------	0-2	*Clay loam	*CL	*A-6	0	0	98-100	96-100	95-100	80-98	30-50	15-30
	2-44	*Clay, Silty clay	*CH	*A-7-6, A-7	0	0	98-100	96-100	95-100	85-98	51-70	30-45
	44-80	*Clay	*CH	*A-7-6, A-7	0	0	100	100	95-100	80-98	51-70	30-45

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Lb:												
Laneville-------	0-7	*Loam	*CL, CL-ML, ML	*A-6, A-4	0	0	100	95-100	90-100	80-95	18-40	3-20
	7-24	*Loam, silt loam	*CL, CL-ML, ML	*A-6, A-4	0	0	100	95-100	90-100	80-95	18-40	3-20
	24-35	*Clay loam, silty clay loam, loam	*CL, CL-ML	*A-6, A-4	0	0	100	95-100	90-100	85-98	20-40	6-20
	35-80	*Clay, Clay loam	*CL, CH	*A-7-6, A-6,	0	0	100	95-100	90-100	85-98	35-55	20-35
LdB:												
Latex-----------	0-7	*Fine sandy loam	*CL-ML, SC, SC-SM, SM	*A-4	0	0	99-100	96-100	90-100	45-75	19-30	2-9
	7-11	*Very fine sandy loam, Fine sandy loam, loam	*CL-ML, SC, SC-SM, SM	*A-4	0	0	99-100	96-100	90-100	45-75	19-30	2-9
	11-30	*Sandy clay loam, Loam, clay loam	*CL, CL-ML	*A-6, A-4	0	0	99-100	95-100	90-100	51-80	20-40	6-25
	30-55	*Loam, clay loam, sandy clay loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0-2	75-100	64-98	62-95	41-80	20-40	6-25
	55-80	*Clay, Silty clay, clay loam	*CH, CL	*A-7-6, A-6	0	0	99-100	95-100	90-100	75-98	41-70	20-43
LiB:												
Letney----------	0-3	*Loamy sand	*SM, SW-SM	*A-2-4	0	0	95-100	95-100	50-75	10-30	16-20	NP-3
	3-24	*Loamy sand	*SM, SW-SM	*A-2-4	0	0	95-100	95-100	50-75	10-30	16-20	NP-3
	24-80	*Sandy clay loam, Sandy loam	*SC, SC-SM	*A-6, A-4	0	0	95-100	95-100	65-90	36-50	20-40	5-20
LiC:												
Lilbert---------	0-3	*Loamy fine sand	*SM	*A-2-4, A-4	0	0	95-100	95-100	80-100	17-40	0-20	NP-3
	3-36	*Loamy fine sand	*SM	*A-2-4, A-4	0	0	95-100	95-100	80-100	17-40	0-20	NP-3
	36-45	*Sandy clay loam, Fine sandy loam	*SC, CL	*A-6, A-4	0	0	95-100	95-100	85-100	36-55	23-39	8-22
	45-80	*Sandy clay loam, Fine sandy loam, clay loam	*CL, SC	*A-6, A-4, A-2-4	0	0	90-100	90-100	85-100	35-75	22-39	8-20
LiD:												
Letney----------	0-6	*Loamy sand	*SM, SP-SM	*A-2-4, A-1-b	0	0	95-100	95-100	50-75	10-30	16-20	NP-3
	6-31	*Loamy sand	*SM, SP-SM	*A-2-4, A-1-b	0	0	95-100	95-100	50-75	10-30	16-20	NP-3
	31-75	*Sandy clay loam, Sandy loam	*SC, SC-SM	*A-6, A-4	0	0	95-100	95-100	65-90	36-50	20-40	5-20
	75-80	*Sandy clay loam, Sandy loam	*SC, SC-SM	*A-6, A-4	0	0	95-100	95-100	65-90	36-50	20-40	5-20

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LnB:												
Lovelady--------	0-6	*Loamy fine sand	*SM, SC-SM	*A-2-4	0	0-1	95-100	95-100	65-95	15-35	0-25	NP-4
	6-32	*Loamy fine sand, Loamy sand	*SM, SC-SM	*A-2-4	0	0-1	95-100	95-100	65-95	15-35	0-22	NP-4
	32-55	*Sandy clay loam, Fine sandy loam	*SC, CL, SC-SM	*A-6, A-4, A-2-4	0	0-2	98-100	90-100	70-95	35-60	25-41	9-21
	55-80	*Clay loam, Fine sandy loam, sandy clay loam, sandy clay	*SC, CH, CL	*A-6, A-2-6	0	0-1	90-100	90-100	75-99	35-60	29-51	12-29
LnD:												
Lovelady--------	0-4	*Loamy fine sand	*SM, SC-SM	*A-2-4	0	0-1	95-100	95-100	65-95	15-35	0-25	NP-4
	4-38	*Loamy fine sand, Loamy sand	*SM, SC-SM	*A-2-4	0	0-1	95-100	95-100	65-95	15-35	0-22	NP-4
	38-42	*Sandy clay loam, Fine sandy loam	*SC, CL, SC-SM	*A-6, A-4, A-2-4	0	0-2	98-100	90-100	70-95	35-60	25-41	9-21
	42-80	*Clay loam, Fine sandy loam, sandy clay loam, sandy clay	*SC, CH, CL	*A-6, A-2-6	0	0-1	90-100	90-100	75-99	35-60	29-51	12-29
MaE:												
Maben-----------	0-4	*Fine sandy loam	*SC, SC-SM, SM	*A-4	0	0	95-100	90-100	70-85	36-50	17-33	2-13
	4-28	*Clay loam, Clay, silty clay	*CL, CH	*A-7-6	0	0	90-100	90-100	90-100	75-95	45-64	25-40
	28-38	*Silt loam, Silty clay loam, clay loam	*CL	*A-6	0	0	100	100	90-100	65-95	31-40	11-18
	38-80	*Bedrock			---	---	---	---	---	---	---	---
MaG:												
Maben-----------	0-3	*Fine sandy loam	*SM, SC-SM	*A-4	0	0	95-100	90-100	70-85	36-50	0-30	NP-7
	3-30	*Silty clay, Clay, clay loam	*CH	*A-7-6	0	0	90-100	90-100	90-100	75-95	45-64	25-40
	30-60	*Bedrock			---	---	---	---	---	---	---	---
Mf:												
Mattex----------	0-3	*Clay loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	100	100	85-100	45-75	20-36	5-16
	3-37	*Sandy clay loam, Loam, very fine sandy loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	100	100	80-95	45-65	20-38	5-19
	37-80	*Clay, Clay loam	*CH, CL	*A-7-6, A-6	0	0	100	100	90-100	70-95	38-48	15-22

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MhC:												
Meth------------	0-4	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	98-100	85-100	65-100	40-75	15-25	NP-5
	4-8	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	98-100	85-100	65-100	40-75	15-25	NP-5
	8-43	*Clay, Sandy clay, clay loam	*CH, CL, SC	*A-7-6, A-6, A-7-5	0	0	100	100	85-100	45-95	36-66	14-34
	43-80	*Sandy clay loam, Sandy loam, fine sandy loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	100	100	75-100	40-60	25-45	5-21
Mi:												
Mattex----------	0-3	*Loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	100	100	85-100	45-75	20-36	5-16
	3-37	*Loam, sandy clay loam, very fine sandy loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	100	100	80-95	45-65	20-38	5-19
	37-80	*Clay loam, Clay	*CL	*A-7-6, A-6	0	0	100	100	90-100	70-95	38-48	15-22
Iulus-----------	0-4	*Fine sandy loam	*ML, CL-ML	*A-4	0	0	95-100	95-100	85-95	51-75	16-25	NP-6
	4-37	*Fine sandy loam, Loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	95-100	85-100	80-95	45-75	16-25	NP-6
	37-80	*Loam, Fine sandy loam, sandy clay loam	*CL, CL-ML, ML, SC, SM	*A-4, A-6	0	0	95-100	90-100	80-95	45-75	16-32	3-15
MiQ:												
Pits, mine or quarry, gravelly-------	0-29	*Gravelly fine sandy loam, Variable			---	---	---	---	---	---	---	---
MiS:												
Metcalf---------	0-7	*Very fine sandy loam	*ML, CL-ML	*A-4	0	0	100	100	90-100	65-90	15-25	NP-6
	7-35	*Loam, Silt loam, clay loam	*CL	*A-6	0	0	100	100	90-100	65-95	31-40	11-18
	35-80	*Clay, Silty clay, clay loam	*CH, CL	*A-7-6, A-6	0	0	100	100	95-100	85-100	46-66	20-38
Sawtown---------	0-11	*Very fine sandy loam	*ML, SC-SM, SM, CL-ML	*A-4	0	0	95-100	95-100	85-100	45-75	0-25	NP-4
	11-30	*Very fine sandy loam, Fine sandy loam, loam	*ML, SC-SM, SM, CL-ML	*A-4	0	0	95-100	95-100	85-100	45-75	0-25	NP-4
	30-49	*Loam, Sandy clay loam, clay loam	*CL, CL-ML	*A-6, A-4	0	0	95-100	95-100	90-100	55-85	24-40	6-22
	49-80	*Clay loam, Clay	*CH, CL	*A-7-6, A-6	0	0	95-100	95-100	90-100	65-95	39-65	20-45

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MpA:												
Mollville-------	0-5	*Loam	*CL, CL-ML, ML	*A-4, A-6	0	0	100	100	85-100	50-80	20-35	3-15
	5-9	*Loam	*CL, CL-ML, ML	*A-4, A-6	0	0	100	100	85-100	50-80	20-35	3-15
	9-57	*Clay loam, sandy clay loam, loam	*CL, SC	*A-6, A-4	0	0	100	100	90-100	45-75	25-40	8-22
	57-76	*Loam, sandy clay loam, clay loam	*CL, SC	*A-6	0	0	100	100	90-100	45-80	30-40	11-20
	76-80	*Fine sandy loam, loamy fine sand	*SM, SC-SM, CL-ML, ML	*A-4, A-2-4	0	0	95-100	95-100	70-95	15-68	0-25	NP-6
Besner----------	0-7	*Fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	7-21	*Fine sandy loam, Very fine sandy loam, loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	90-100	29-66	0-25	NP-7
	21-46	*Fine sandy loam, Loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	95-100	80-100	29-66	0-25	NP-7
	46-80	*Loam, Sandy clay loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	100	95-100	80-100	36-75	18-30	6-15
MsB:												
Moswell---------	0-5	*Loam	*ML	*A-4,	0	0	97-100	95-100	80-95	51-70	0-30	NP-7
	5-13	*Clay	*CH	*A-7-6	0	0	97-100	95-100	90-100	85-99	65-95	35-65
	13-43	*Clay	*CH	*A-7-6	0	0	97-100	95-100	90-100	85-99	70-95	40-65
	43-80	*Clay, silty clay loam	*CH, CL	*A-7-6, A-6	0	0	97-100	95-100	90-100	85-99	70-95	55-70
MsD:												
Moswell---------	0-8	*Loam	*ML	*A-4,	0	0	97-100	95-100	80-95	51-70	0-30	NP-7
	8-14	*Clay	*CH	*A-7-6	0	0	97-100	95-100	90-100	85-99	65-95	35-65
	14-42	*Clay	*CH	*A-7-6	0	0	97-100	95-100	90-100	85-99	70-95	40-65
	42-80	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	90-100	51-70	30-45
NaB:												
Naclina---------	0-6	*Clay loam	*CL	*A-6	0	0	98-100	96-100	95-100	80-98	30-50	15-30
	6-21	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	85-98	58-76	35-50
	21-56	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	85-98	58-76	35-50
	56-70	*Clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	80-98	58-76	35-50
	70-80	*Clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	80-98	58-76	35-50

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
NaD:												
Naclina---------	0-3	*Clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	85-98	51-70	26-40
	3-12	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	85-98	58-76	35-50
	12-42	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	85-98	58-76	35-50
	42-59	*Clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	80-98	58-76	35-50
	59-80	*Clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	80-98	58-76	35-50
NeB:												
Nacogdoches-----	0-7	*Fine sandy loam	*SC-SM, SC, SM	*A-2-4, A-4	0	0	90-100	83-100	68-100	25-45	20-30	2-10
	7-49	*Clay	*CH, CL	*A-7-6, A-6	0	0	90-100	75-98	70-95	51-75	41-60	18-30
	49-80	*Clay, Clay loam	*CH, CL, MH, ML	*A-7-6, A-6, A-7-5	0	0	90-100	75-98	70-95	51-70	41-60	17-28
NeE:												
Nacogdoches-----	0-6	*Clay loam	*CL, CL-ML, SC, SC-SM	*A-4, A-6	0	0	90-100	85-100	65-95	36-65	25-35	6-12
	6-60	*Clay	*CH, CL	*A-7-6	0	0	90-100	75-98	70-95	51-75	41-60	18-30
	60-80	*Clay, Clay loam	*CH, CL, MH, ML	*A-7-6, A-6	0	0	90-100	75-98	70-95	51-70	41-60	17-28
Ow:												
Owentown--------	0-3	*Fine sandy loam	*CL-ML, ML, SC-SM, SM	*A-4	0	0	100	95-100	80-100	36-66	16-28	NP-10
	3-50	*Fine sandy loam, Loam	*CL-ML, ML, SC-SM, SM	*A-4	0	0	100	95-100	80-100	36-66	16-28	NP-10
	50-80	*Fine sandy loam, Loamy fine sand, loam	*SC-SM, SC, SM	*A-2-4, A-4	0	0	100	95-100	80-100	20-49	16-28	NP-10

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
PeC:												
Penning----------	0-4	*Loam	*CL-ML, CL, ML	*A-4	0	0	100	95-100	90-100	60-85	16-25	3-10
	4-14	*Loam, Very fine sandy loam	*CL-ML, CL, ML	*A-4	0	0	100	95-100	90-100	60-85	16-25	3-10
	14-48	*Sandy clay loam, Very fine sandy loam, loam	*CL, CL-ML	*A-4, A-6	0	0	98-100	95-100	90-100	65-90	20-35	4-15
	48-56	*Sandy clay loam, Loam	*CL, CL-ML	*A-6, A-4, A-7-6	0	0	98-100	95-100	90-100	65-90	25-45	5-22
	56-80	*Clay, bedrock, Clay loam	*CL, CH	*A-7-6	0	0	98-100	95-100	90-100	70-99	41-55	22-40
Kurth------------	0-7	*Fine sandy loam	*SM, SC-SM	*A-4, A-2-4	0	0	98-100	98-100	85-100	25-50	15-30	NP-7
	7-28	*Fine sandy loam	*SM, SC-SM	*A-4, A-2-4	0	0	98-100	98-100	85-100	25-50	15-30	NP-7
	28-46	*Sandy clay loam, Fine sandy loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	98-100	96-100	85-100	40-80	23-38	7-15
	46-62	*Clay loam, Clay	*CL, CH	*A-6, A-7-6	0	0	98-100	96-100	85-100	60-90	38-56	25-32
	62-80	*Stratified loam, Stratified sandy clay loam, stratified clay loam	*CL, SC, CL-ML, SC-SM	*A-4, A-6	0	0	98-100	95-100	85-100	40-70	21-34	5-13
PoA:												
Pophers----------	0-2	*Silt loam	*CL	*A-6	0	0	98-100	98-100	96-100	80-98	25-41	11-17
	2-64	*Silty clay loam, Silt loam, loam	*CL	*A-6, A-7-6	0	0	98-100	98-100	96-100	80-98	25-45	11-29
	64-80	*Silty clay loam, Clay loam, silt loam	*CL	*A-6, A-7-6	0	0	98-100	98-100	96-100	80-98	25-49	12-30
RaD:												
Rayburn----------	0-5	*Loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2-4	0	0	100	100	70-99	25-65	16-25	NP-7
	5-43	*Clay, Silty clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	51-80	25-50
	43-52	*Clay, Silty clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	51-80	25-50
	52-72	*Bedrock			---	---	---	---	---	---	---	---
RkB:												
Raylake----------	0-6	*Clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	90-100	51-70	30-45
	6-15	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	90-100	51-70	30-45
	15-48	*Clay	*CH	*A-7-6	0	0	95-100	95-100	95-100	90-100	51-70	30-45
	48-61	*Clay, Channery clay	*CH	*A-7-6	0	0	95-100	95-100	95-100	80-100	51-70	30-45
	61-80	*Clay, Channery clay	*CH	*A-7-6	0	0	95-100	95-100	95-100	80-100	51-70	30-45

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RkD:												
Raylake---------	0-3	*Clay loam	*CL	*A-6	0	0	98-100	96-100	95-100	80-98	30-50	15-30
	3-9	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	96-100	95-100	90-100	51-70	30-45
	9-58	*Clay	*CH	*A-7-6	0	0	95-100	95-100	95-100	90-100	51-70	30-45
	58-72	*Clay, Channery clay	*CH	*A-7-6	0	0	95-100	95-100	95-100	80-100	51-70	30-45
RnB:												
Rentzel---------	0-3	*Loamy fine sand	*SM	*A-2-4, A-4	0	0	97-100	95-100	75-98	15-40	0-30	NP-4
	3-28	*Loamy fine sand	*SM	*A-4, A-2-4	0	0	97-100	95-100	75-98	15-40	0-30	NP-4
	28-80	*Fine sandy loam, sandy clay loam	*SC, CL, CL-ML, SC-SM	*A-6, A-4	0	0	95-100	90-100	75-98	36-55	20-43	4-22
RsB:												
Rosenwall-------	0-4	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	95-100	95-100	75-95	45-70	16-30	NP-7
	4-24	*Clay	*CH	*A-7-6	0	0	95-100	95-100	90-100	75-95	60-75	30-41
	24-38	*Clay	*CH, SC	*A-7-6	0	0-3	85-100	80-100	75-100	28-84	21-45	7-26
	38-80	*Clay	*CH, SC	*A-7-6	0	0-3	85-100	80-100	75-100	28-84	21-45	7-26
RsD:												
Rosenwall-------	0-5	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4,	0	0	95-100	95-100	75-95	45-70	16-30	NP-7
	5-32	*Clay	*CH	*A-7-6	0	0	95-100	95-100	90-100	75-95	60-75	30-41
	32-60	*Clay	*CH, SC	*A-7-6	0	0-3	85-100	80-100	75-100	28-84	21-45	7-26
	60-80	*Clay	*CH, SC SC-	*A-7-6	0	0-3	85-100	80-100	75-100	28-84	21-45	7-26
SaB:												
Sacul-----------	0-4	*Fine sandy loam	*SM, SC-SM	*A-4, A-2, A-1-b	0	0	75-100	75-100	45-85	25-50	15-25	NP-7
	4-12	*Fine sandy loam, Very fine sandy loam, loamy fine sand	*SC-SM, CL-ML, ML, SM	*A-4, A-1-b, A-2	0	0	75-100	75-100	40-95	12-75	15-30	NP-10
	12-39	*Clay, Gravelly clay	*CH, CL	*A-7-6	---	---	95-100	85-100	85-99	51-75	41-60	20-35
	39-53	*Sandy clay, Clay, gravelly clay	*CH, CL	*A-7-6	---	---	95-100	85-100	85-99	51-75	41-60	20-35
	53-62	*Clay loam, Clay, gravelly clay, sandy clay	*CH, CL	*A-7-6	---	---	95-100	85-100	85-99	51-75	41-60	20-35
	62-80	*Clay loam, silty clay loam, loam	*CL, SC	*A-6, A-2-4, A-4	0	0	85-100	85-100	65-100	30-95	25-48	8-25

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SeB:												
Sawlit----------	0-9	*Fine sandy loam	*SC-SM, CL-ML, ML, SM	*A-4	0	0	95-100	90-100	80-95	35-50	15-27	NP-7
	9-12	*Fine sandy loam, Very fine sandy loam, loam	*SC-SM, CL-ML, ML, SM	*A-4	0	0	95-100	90-100	80-95	35-50	15-27	NP-7
	12-25	*Sandy clay loam, loam, clay loam	*CL, CL-ML	*A-6, A-4	0	0	96-100	95-100	85-100	60-85	24-40	6-22
	25-43	*Clay loam, sandy clay loam, loam	*CL, CL-ML	*A-6, A-4	0	0	96-100	95-100	85-100	65-90	31-47	10-25
	43-80	*Clay, Clay loam	*CH, CL	*A-7-6, A-6	0	0	96-100	95-100	85-100	65-95	40-62	25-36
SfA:												
Sawtown---------	0-4	*Very fine sandy loam	*ML, SC-SM, SM, CL-ML	*A-4	0	0	95-100	95-100	85-100	45-75	0-25	NP-4
	4-30	*Fine sandy loam, Very fine sandy loam, loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	95-100	95-100	85-100	45-80	0-25	NP-6
	30-54	*Sandy clay loam, Loam, clay loam	*CL, CL-ML	*A-6, A-4	0	0	95-100	95-100	90-100	55-85	24-40	6-22
	54-80	*Clay, Clay loam	*CH, CL	*A-7-6, A-6	0	0	95-100	95-100	90-100	65-95	39-65	20-45
SmB:												
Smithdale-------	0-5	*Sandy loam	*SC-SM, SM, SC	*A-4, A-2-4	0	0	85-100	78-100	70-99	30-47	0-31	NP-10
	5-11	*Sandy loam	*SC-SM, SM, SC	*A-4, A-2-4	0	0	85-100	78-100	70-99	30-47	0-31	NP-10
	11-36	*Sandy clay loam, Loam, clay loam	*CL, SC	*A-6, A-7-6	0	0	100	85-100	80-95	36-75	25-45	11-20
	36-80	*Fine sandy loam, Sandy loam, loamy sand	*ML, CL-ML, SC-SM, SM	*A-4, A-2-4	0	0	100	85-100	65-85	30-75	0-27	NP-7
TeD:												
Tehran----------	0-17	*Loamy sand	*SM	*A-2-4	0	0	95-100	95-100	50-80	15-30	16-20	NP-3
	17-73	*Loamy sand	*SM	*A-2-4	0	0	95-100	95-100	50-80	15-30	16-20	NP-3
	73-80	*Sandy loam, sandy clay loam	*SC, SC-SM	*A-6, A-2-4, A-2-6, A-4	0	0	95-100	95-100	60-80	24-50	20-37	5-16

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
TnB:												
Tenaha----------	0-4	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	95-100	95-100	70-95	15-40	16-20	NP-4
	4-24	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	95-100	78-100	70-95	15-40	16-20	NP-4
	24-38	*Sandy clay loam, Fine sandy loam, clay loam	*CL, SC	*A-6, A-4	0	0	95-100	95-100	80-100	36-66	25-46	8-26
	38-47	*Sandy clay loam, Fine sandy loam, sandy loam	*CL, SC	*A-6, A-4	0	0	95-100	95-100	80-100	36-66	25-46	8-26
	47-80	*Sandy clay loam	*CL, SC	*A-6, A-2-6,	0-1	0-3	89-100	85-100	80-100	28-84	25-45	11-26
TnD:												
Tenaha----------	0-3	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	95-100	95-100	70-95	15-40	16-20	NP-4
	3-24	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	95-100	78-100	70-95	15-40	16-20	NP-4
	24-40	*Sandy clay loam, Fine sandy loam, clay loam	*CL, SC	*A-6, A-4	0	0	95-100	95-100	80-100	36-66	25-46	8-26
	40-51	*Sandy loam, loam, sandy clay loam	*SM, SC, CL	*A-6, A-4	0	0	95-100	95-100	80-100	36-66	25-46	8-26
	51-80	*Sandy loam, sandy clay loam	*SM, SC, CL	*A-6, A-2-6	0-1	0-3	89-100	85-100	80-100	28-84	25-45	11-26
TnG:												
Tenaha----------	0-3	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	95-100	95-100	70-95	15-40	16-20	NP-4
	3-21	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	95-100	78-100	70-95	15-40	16-20	NP-4
	21-43	*Sandy clay loam, Fine sandy loam, clay loam	*CL, SC	*A-6, A-7-6, A-4	0	0	95-100	95-100	80-100	36-66	25-46	8-26
	43-80	*Sandy clay loam	*CL, SC	*A-6, A-2-6	0-1	0-3	89-100	85-100	80-100	28-84	25-45	11-26
TsB:												
Tonkawa---------	0-15	*Fine sand	*SP-SM	*A-2-4, A-3	0	0	100	97-100	90-100	6-12	16-20	NP-3
	15-80	*Fine sand, Sand	*SP-SM	*A-2-4, A-3	0	0	100	95-100	90-100	6-12	16-20	NP-3
TsD:												
Tonkawa---------	0-7	*Fine sand	*SP-SM	*A-2-4, A-3	0	0	100	97-100	90-100	6-12	16-20	NP-3
	7-80	*Fine sand, Sand	*SP-SM	*A-2-4, A-3	0	0	100	95-100	90-100	6-12	16-20	NP-3
Tu:												
Tuscosso--------	0-5	*Loam	*CL	*A-6, A-4	0	0	100	100	90-100	54-92	25-47	8-25
	5-40	*Clay loam, clay, silty clay	*CH, CL	*A-7-6, A-6	0	0	100	97-100	85-100	75-98	41-60	18-30
	40-80	*Clay loam, clay, silty clay	*CH, CL	*A-7-6, A-6	0	0	100	97-100	85-100	75-98	41-60	18-30

Table 27.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
TuD:												
Trawick---------	0-6	*Gravelly clay loam	*SC-SM, SM	*A-2-4, A-4	0	1-5	70-80	65-80	60-70	20-40	20-30	2-7
	6-35	*Clay, Clay loam	*CH, CL	*A-7-6, A-6	0	0	90-100	75-98	70-85	51-75	41-60	18-30
	35-41	*Clay loam, clay	*CL, CH	*A-6, A-7-6	0	0	90-100	75-98	70-85	51-75	41-60	18-30
	41-80	*Bedrock			---	---	---	---	---	---	---	---
TuG:												
Trawick---------	0-3	*Clay loam	*SC-SM, CL, CL-ML, SC	*A-6, A-4	0	0	90-100	90-100	85-95	25-55	20-30	4-10
	3-20	*Clay, Clay loam	*CH, CL	*A-7-6	0	0	90-100	75-98	70-85	51-75	41-60	18-30
	20-37	*Clay, Clay loam	*CH, CL	*A-7-6	0	0	90-100	75-98	70-85	51-75	41-60	18-30
	37-80	*Bedrock			---	---	---	---	---	---	---	---
WeB:												
Woden-----------	0-5	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	98-100	98-100	70-85	40-65	0-23	NP-7
	5-12	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	98-100	98-100	70-85	40-65	0-23	NP-7
	12-80	*Fine sandy loam, Loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	98-100	98-100	70-85	40-65	0-23	NP-7
W:												
Water-----------	---	---	---	---	---	---	---	---	---	---	---	---

Table 28.--Physical Soil Properties

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
AaB:												
Alazan--------------	0-3	4-15	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	3-12	4-15	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24			
	12-20	18-25	1.45-1.70	0.6-2	0.12-0.18	0.0-2.9	0.1-1.0	.28	.37			
	20-26	20-35	1.30-1.55	0.6-2	0.13-0.18	3.0-5.9	0.3-1.0	.37	.37			
	26-80	20-35	1.30-1.55	0.6-2	0.13-0.18	3.0-5.9	0.3-1.0	.37	.37			
AbA:												
Alazan--------------	0-5	5-15	1.40-1.65	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	5-11	5-15	1.40-1.65	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.37	.37			
	11-37	18-25	1.45-1.70	0.6-2	0.12-0.18	0.0-2.9	0.1-1.0	.28	.37			
	37-80	18-25	1.45-1.70	0.6-2	0.12-0.18	0.0-2.9	0.1-1.0	.28	.37			
Besner--------------	0-24	4-15	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	24-53	8-18	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
	53-80	10-25	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
AtA:												
Alto----------------	0-7	20-35	1.30-1.60	0.6-2	0.12-0.17	0.0-2.9	0.5-1.0	.32	.32	5	5	56
	7-41	27-45	1.40-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.32	.32			
	41-58	25-35	1.45-1.65	0.6-2	0.12-0.16	3.0-5.9	0.1-0.5	.32	.32			
	58-80	40-60	1.50-1.70	0.2-0.6	0.10-0.14	3.0-5.9	0.1-0.5	.32	.32			
AtB:												
Attoyac-------------	0-5	8-20	1.30-1.50	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	5-10	8-20	1.30-1.50	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.28	.28			
	10-80	18-32	1.40-1.65	0.6-2	0.13-0.18	0.0-2.9	0.5-1.0	.32	.32			
AuD:												
Austonio------------	0-8	5-15	1.25-1.40	2-6	0.11-0.15	0.0-2.9	0.5-2.0	.20	.20	5	3	86
	8-16	5-15	1.25-1.40	2-6	0.11-0.15	0.0-2.9	0.1-1.0	.32	.32			
	16-70	18-30	1.35-1.60	0.6-2	0.12-0.16	3.0-5.9	0.1-1.0	.32	.32			
	70-80	3-15	1.45-1.65	2-6	0.07-0.12	0.0-2.9	0.1-1.0	.20	.20			
BaB:												
Bernaldo------------	0-5	4-15	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	5-15	3-15	1.30-1.50	2-6	0.11-0.16	0.0-2.9	0.1-1.0	.32	.32			
	15-41	15-30	1.40-1.65	0.6-2	0.13-0.18	3.0-5.9	0.1-1.0	.32	.32			
	41-80	10-30	1.45-1.65	0.6-2	0.13-0.18	0.0-2.9	0.1-1.0	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
BeA:												
Besner----------------	0-6	4-15	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	6-25	4-17	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.24	.24			
	25-62	8-18	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
	62-80	10-25	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
BfA:												
Betis-----------------	0-7	2-10	1.20-1.50	6-20	0.05-0.10	0.0-2.9	0.5-2.0	.17	.17	5	2	134
	7-28	2-10	1.20-1.50	6-20	0.05-0.10	0.0-2.9	0.1-1.0	.17	.17			
	28-80	5-15	1.20-1.50	6-20	0.08-0.11	0.0-2.9	0.1-1.0	.17	.17			
BoC:												
Bowie-----------------	0-9	3-15	1.40-1.69	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.32	.32	5	3	86
	9-17	3-15	1.40-1.69	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.32	.32			
	17-25	18-35	1.60-1.69	0.6-2	0.10-0.16	0.0-2.9	0.1-1.0	.32	.32			
	25-80	18-35	1.60-1.80	0.2-0.6	0.10-0.16	0.0-2.9	0.1-1.0	.32	.32			
BuB:												
Bub-------------------	0-4	27-35	1.25-1.45	0.6-2	0.11-0.15	0.0-2.9	0.5-2.0	.32	.37	2	8	0
	4-18	35-55	1.30-1.50	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	18-80	---	---	0.00- 0.00	---	---	---	---	---			
ChA:												
Chireno---------------	0-7	15-30	1.30-1.50	0.2-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.32	.32	5	4	86
	7-33	27-45	1.40-1.60	0.2-0.6	0.10-0.16	6.0-8.9	0.1-2.0	.32	.32			
	33-50	27-45	1.40-1.60	0.2-0.6	0.10-0.16	6.0-8.9	0.1-2.0	.32	.32			
	50-80	27-45	1.40-1.60	0.2-0.6	0.10-0.16	6.0-8.9	0.1-2.0	.32	.32			
CoB:												
Corrigan--------------	0-6	5-15	1.20-1.45	0.6-2	0.11-0.15	0.0-2.9	0.5-3.0	.43	.43	3	3	86
	6-14	5-15	1.20-1.45	0.6-2	0.11-0.15	0.0-2.9	0.5-3.0	.43	.43			
	14-39	40-60	1.20-1.35	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	39-80	---	---	0.06-0.6	---	---	---	---	---			
CrG:												
Cuthbert--------------	0-2	27-35	1.30-1.50	0.6-2	0.07-0.15	0.0-2.9	0.5-2.0	.20	.32	3	8	0
	2-22	25-60	1.20-1.45	0.2-0.6	0.10-0.15	3.0-5.9	0.5-1.0	.32	.32			
	22-80	20-45	1.40-1.65	0.2-0.6	0.08-0.14	3.0-5.9	0.1-1.0	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
CtE:												
Cuthbert------------	0-6	2-15	1.20-1.40	2-6	0.09-0.12	0.0-2.9	0.5-2.0	.28	.28	3	3	86
	6-10	2-15	1.20-1.40	2-6	0.09-0.12	0.0-2.9	0.5-2.0	.28	.28			
	10-37	25-60	1.24-1.45	0.2-0.6	0.10-0.15	3.0-5.9	0.1-1.0	.32	.32			
	37-80	20-60	1.40-1.65	0.06-0.6	0.08-0.14	3.0-5.9	0.1-0.5	.32	.32			
CtG:												
Cuthbert------------	0-6	2-15	1.20-1.40	2-6	0.09-0.12	0.0-2.9	0.5-2.0	.28	.28	3	3	86
	6-10	2-15	1.20-1.40	2-6	0.09-0.12	0.0-2.9	0.5-2.0	.28	.28			
	10-33	25-60	1.24-1.45	0.2-0.6	0.10-0.15	3.0-5.9	0.1-1.0	.32	.32			
	33-80	15-50	1.35-1.60	0.2-0.6	0.08-0.14	3.0-5.9	0.1-0.5	.32	.32			
CtS:												
Cuthbert------------	0-3	2-15	1.45-1.60	2-6	0.07-0.11	0.0-2.9	0.5-2.0	.28	.28	3	8	0
	3-30	25-60	1.25-1.45	0.2-0.6	0.10-0.15	3.0-5.9	0.5-1.0	.32	.32			
	30-80	20-35	1.40-1.65	0.06-0.6	0.08-0.14	3.0-5.9	0.5-1.0	.32	.32			
CuE:												
Cuthbert------------	0-6	2-15	1.20-1.40	2-6	0.07-0.11	0.0-2.9	0.5-2.0	.20	.28	3	8	0
	6-31	25-60	1.24-1.45	0.2-0.6	0.10-0.15	3.0-5.9	0.1-1.0	.32	.32			
	31-37	15-50	1.35-1.60	0.2-0.6	0.08-0.14	3.0-5.9	0.1-0.5	.32	.32			
	37-80	20-35	1.40-1.65	0.2-0.6	0.08-0.14	3.0-5.9	0.1-1.0	.32	.32			
DaC:												
Darco---------------	0-9	3-15	1.35-1.55	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	9-70	3-15	1.60-1.85	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17			
	70-80	12-35	1.40-1.65	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24			
DaE:												
Darco---------------	0-6	3-15	1.35-1.55	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	6-49	3-15	1.60-1.85	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17			
	49-61	12-35	1.40-1.65	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24			
	61-80	12-35	1.40-1.65	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24			
DsA:												
Dreka---------------	0-9	10-30	1.25-1.35	0.6-2	0.12-0.18	0.0-2.9	0.5-2.0	.37	.37	5	6	48
	9-43	18-35	1.30-1.45	0.2-0.6	0.12-0.18	3.0-5.9	0.5-1.0	.32	.32			
	43-80	35-50	1.35-1.55	0.06-0.2	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
EeB:												
Eastwood------------	0-7	3-18	1.20-1.60	0.6-2	0.11-0.15	0.0-2.9	0.5-1.0	.55	.55	4	3	86
	7-10	3-18	1.20-1.60	0.6-2	0.11-0.15	0.0-2.9	0.5-1.0	.55	.55			
	10-19	40-65	1.20-1.45	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	19-55	40-65	1.20-1.45	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	55-80	15-40	1.35-1.65	0.06-0.2	0.10-0.15	3.0-5.9	0.5-1.0	.37	.37			
EeD:												
Eastwood------------	0-4	3-18	1.20-1.60	0.6-2	0.11-0.15	0.0-2.9	0.5-1.0	.55	.55	4	3	86
	4-47	40-65	1.20-1.45	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	47-80	15-40	1.35-1.65	0.06-0.2	0.10-0.15	3.0-5.9	0.5-1.0	.37	.37			
ElA:												
Eastwood------------	0-6	3-18	1.20-1.60	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.49	.49	4	3	86
	6-35	40-65	1.20-1.45	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	35-43	25-40	1.20-1.50	0.06-0.2	0.12-0.20	6.0-8.9	0.5-1.0	.32	.32			
	43-80	28-40	1.35-1.65	0.06-0.2	0.10-0.15	3.0-5.9	0.5-1.0	.37	.37			
Latex---------------	0-14	2-18	1.28-1.45	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	14-31	18-35	1.28-1.45	0.6-2	0.11-0.18	3.0-5.9	0.1-1.0	.32	.32			
	31-39	18-35	1.30-1.45	0.6-2	0.13-0.18	3.0-5.9	0.1-1.0	.32	.32			
	39-80	35-55	1.30-1.65	0.06-0.2	0.12-0.17	6.0-8.9	0.1-1.0	.32	.32			
EtB:												
Etoile--------------	0-8	10-25	1.35-1.55	0.6-2	0.12-0.17	0.0-2.9	0.3-2.0	.43	.43	5	5	86
	8-32	40-60	1.35-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.2-1.0	.32	.32			
	32-51	40-60	1.35-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.2-1.0	.32	.32			
	51-80	35-60	1.35-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.32	.32			
EtD:												
Etoile--------------	0-4	10-20	1.35-1.55	0.6-2	0.12-0.17	0.0-2.9	0.3-2.0	.43	.43	5	5	86
	4-43	40-60	1.35-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.2-1.0	.32	.32			
	43-80	40-60	1.35-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.32	.32			
GaA:												
Gallime-------------	0-4	10-20	1.30-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.32	.32	5	3	86
	4-25	10-20	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.3-1.0	.32	.32			
	25-80	18-35	1.40-1.65	0.6-2	0.13-0.18	3.0-5.9	0.1-1.0	.32	.32			
Alazan--------------	0-3	4-15	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	3-12	4-15	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24			
	12-80	18-35	1.45-1.70	0.6-2	0.12-0.18	0.0-2.9	0.1-1.0	.28	.37			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
GaB:												
Gallime	0-3	10-20	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.3-1.0	.32	.32	5	3	86
	3-20	10-20	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.3-1.0	.32	.32			
	20-80	18-35	1.40-1.65	0.6-2	0.13-0.18	3.0-5.9	0.1-1.0	.32	.32			
GaC:												
Gallime	0-27	3-15	1.30-1.50	2-6	0.11-0.16	0.0-2.9	0.1-1.0	.32	.32	5	3	86
	27-45	10-20	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.3-1.0	.32	.32			
	45-80	18-35	1.40-1.65	0.6-2	0.13-0.18	3.0-5.9	0.1-1.0	.32	.32			
Guyton	0-5	7-25	1.35-1.65	0.6-2	0.20-0.23	0.0-2.9	0.5-4.0	.43	.43	5	5	56
	5-11	7-25	1.35-1.65	0.6-2	0.20-0.23	0.0-2.9	0.5-4.0	.43	.43			
	11-26	18-35	1.35-1.65	0.2-0.6	0.15-0.20	0.0-2.9	0.0-0.5	.37	.37			
	26-49	18-35	1.35-1.65	0.2-0.6	0.15-0.20	0.0-2.9	0.0-0.5	.37	.37			
	49-80	20-35	1.35-1.70	0.06-0.2	0.15-0.22	0.0-2.9	0.5-1.0	.37	.37			
GrB:												
Grapeland	0-6	3-8	1.35-1.50	6-20	0.05-0.10	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	6-80	6-12	1.35-1.65	6-20	0.05-0.12	0.0-2.9	0.1-0.5	.20	.20			
GtA:												
Guyton	0-7	7-25	1.35-1.65	0.6-2	0.20-0.23	0.0-2.9	0.5-3.0	.43	.43	5	5	56
	7-16	7-25	1.35-1.65	0.6-2	0.20-0.23	0.0-2.9	0.5-3.0	.43	.43			
	16-80	20-35	1.35-1.65	0.06-0.2	0.15-0.22	0.0-2.9	0.5-1.0	.37	.37			
GuA:												
Guyton	0-16	7-25	1.35-1.65	0.6-2	0.20-0.23	0.0-2.9	0.5-4.0	.43	.43	5	5	56
	16-32	20-35	1.35-1.70	0.06-0.2	0.15-0.22	0.0-2.9	0.5-1.0	.37	.37			
	32-80	20-35	1.35-1.70	0.06-0.2	0.15-0.22	0.0-2.9	0.5-1.0	.37	.37			
Sawtown	0-24	4-12	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.37	.37	5	5	56
	24-42	15-30	1.30-1.55	0.6-2	0.11-0.16	3.0-5.9	0.5-1.0	.32	.32			
	42-80	35-50	1.20-1.45	0.00-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
HaA:												
Hainesville	0-2	4-15	1.35-1.65	6-20	0.07-0.11	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	2-7	4-15	1.35-1.65	6-20	0.07-0.11	0.0-2.9	0.5-2.0	.20	.20			
	7-22	2-15	1.35-1.60	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.20	.20			
	22-80	5-20	1.35-1.70	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.20	.20			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
Hc:												
Hannahatchee--------	0-4	10-20	1.30-1.65	2-6	0.10-0.15	0.0-2.9	0.5-2.0	.32	.32	5	3	86
	4-25	15-25	1.40-1.60	0.6-2	0.12-0.17	0.0-2.9	0.5-1.0	.32	.32			
	25-80	18-35	1.40-1.55	0.6-2	0.12-0.17	0.0-2.9	0.5-1.0	.32	.32			
HeB:												
Herty---------------	0-2	6-15	1.20-1.40	0.6-2	0.12-0.18	0.0-2.9	0.5-2.0	.43	.49	5	3	86
	2-7	6-15	1.20-1.40	0.6-2	0.12-0.18	0.0-2.9	0.5-2.0	.43	.49			
	7-20	35-45	1.40-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.1-1.0	.37	.37			
	20-31	40-70	1.20-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	31-45	40-70	1.20-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	45-60	35-70	1.15-1.35	0.00-0.06	0.10-0.16	6.0-8.9	0.1-0.4	.37	.37			
Ia:												
Iulus---------------	0-10	6-15	1.20-1.40	0.6-2	0.11-0.18	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	10-46	6-20	1.26-1.45	0.6-2	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32			
	46-80	3-12	1.50-1.65	2-6	0.07-0.11	0.0-2.9	0.0-0.5	.20	.20			
Iu:												
Iulus---------------	0-8	8-15	1.30-1.45	2-6	0.10-0.15	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	8-24	6-20	1.26-1.45	0.6-2	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32			
	24-80	10-28	1.30-1.50	0.6-2	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32			
KhB:												
Kirvin--------------	0-3	10-20	1.45-1.70	2-6	0.11-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	3-12	10-20	1.45-1.70	2-6	0.11-0.15	0.0-2.9	1.0-3.0	.24	.24			
	12-40	35-60	1.24-1.45	0.2-0.6	0.11-0.15	3.0-5.9	0.1-1.0	.32	.32			
	40-51	35-60	1.24-1.45	0.2-0.6	0.11-0.15	3.0-5.9	0.1-1.0	.32	.32			
	51-57	20-35	1.45-1.70	0.6-2	0.15-0.19	3.0-5.9	0.1-1.0	.32	.32			
	57-80	---	---	0.2-20	---	---	0.0-0.0	---	---			
KiC:												
Kirvin--------------	0-7	2-15	1.20-1.40	2-6	0.07-0.11	0.0-2.9	0.5-2.0	.20	.28	4	3	86
	7-34	35-60	1.24-1.45	0.2-0.6	0.11-0.15	3.0-5.9	0.1-1.0	.32	.32			
	34-46	25-50	1.35-1.60	0.2-0.6	0.11-0.15	3.0-5.9	0.1-1.0	.32	.32			
	46-80	20-35	1.40-1.65	0.2-0.6	0.08-0.14	3.0-5.9	0.1-1.0	.32	.32			
KiD:												
Kirvin--------------	0-3	20-35	1.45-1.70	0.6-2	0.15-0.19	3.0-5.9	0.1-1.0	.32	.32	4	8	0
	3-40	25-50	1.35-1.60	0.2-0.6	0.11-0.15	3.0-5.9	0.1-1.0	.32	.32			
	40-80	20-35	1.40-1.65	0.2-0.6	0.08-0.14	3.0-5.9	0.1-1.0	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
KkD:												
Kisatchie-----------	0-3	5-15	1.20-1.45	0.6-2	0.11-0.15	0.0-2.9	0.5-3.0	.43	.43	3	3	86
	3-5	5-15	1.20-1.45	0.6-2	0.11-0.15	0.0-2.9	0.5-3.0	.43	.43			
	5-26	40-60	1.20-1.35	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	26-80	---	---	0.06-0.6	---	---	---	---	---			
KuB:												
Kurth---------------	0-8	3-10	1.30-1.45	0.6-2	0.10-0.16	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	8-26	3-10	1.30-1.45	0.6-2	0.10-0.16	0.0-2.9	0.5-2.0	.28	.28			
	26-50	18-35	1.50-1.65	0.6-2	0.11-0.17	3.0-5.9	0.1-1.0	.32	.32			
	50-61	35-45	1.45-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	61-80	15-30	1.60-1.70	0.06-0.2	0.09-0.14	0.0-2.9	0.1-1.0	.32	.32			
KwA:												
Kawah---------------	0-22	1-5	1.50-1.65	6-20	0.04-0.07	0.0-2.9	0.5-2.0	.15	.15	5	1	250
	22-80	1-5	1.50-1.70	6-20	0.04-0.07	0.0-2.9	0.1-1.0	.15	.15			
La:												
Laneville-----------	0-13	10-26	1.25-1.35	0.6-2	0.11-0.16	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	13-42	18-35	1.30-1.45	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	42-80	35-50	1.40-1.55	0.06-0.2	0.12-0.18	6.0-8.9	0.1-1.0	.32	.32			
LaB:												
LaCerda-------------	0-3	30-40	1.30-1.40	0.06-0.2	0.14-0.20	6.0-8.9	0.1-1.0	.32	.32	5	4	86
	3-60	60-70	1.30-1.55	0.00-0.06	0.08-0.19	6.0-8.9	0.1-0.5	.32	.32			
	60-80	60-70	1.35-1.55	0.00-0.06	0.08-0.14	6.0-8.9	0.1-0.5	.32	.32			
LaE:												
LaCerda-------------	0-2	30-40	1.30-1.40	0.06-0.2	0.14-0.20	6.0-8.9	0.1-1.0	.32	.32	5	4	86
	2-44	60-70	1.30-1.55	0.00-0.06	0.08-0.19	6.0-8.9	0.1-0.5	.32	.32			
	44-80	60-70	1.35-1.55	0.00-0.06	0.08-0.14	6.0-8.9	0.1-0.5	.32	.32			
Lb:												
Laneville-----------	0-7	10-26	1.25-1.35	0.6-2	0.11-0.16	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	7-24	10-26	1.25-1.35	0.6-2	0.11-0.16	0.0-2.9	1.0-3.0	.37	.37			
	24-35	18-35	1.30-1.45	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	35-80	35-50	1.40-1.55	0.06-0.2	0.12-0.18	6.0-8.9	0.1-1.0	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
LdB:												
Latex---------------	0-7	2-18	1.28-1.45	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	7-11	2-18	1.28-1.45	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.37	.37			
	11-30	18-35	1.28-1.45	0.6-2	0.11-0.18	3.0-5.9	0.1-1.0	.32	.32			
	30-55	18-35	1.30-1.45	0.6-2	0.13-0.18	3.0-5.9	0.1-1.0	.32	.32			
	55-80	35-55	1.30-1.65	0.06-0.2	0.12-0.17	6.0-8.9	0.1-1.0	.32	.32			
LiB:												
Letney--------------	0-3	2-8	1.50-1.65	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	3-24	2-8	1.50-1.65	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20			
	24-80	18-35	1.55-1.70	2-6	0.12-0.17	0.0-2.9	0.1-0.5	.24	.24			
LiC:												
Lilbert-------------	0-3	3-15	1.50-1.60	6-20	0.05-0.10	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	3-36	3-15	1.50-1.65	6-20	0.05-0.10	0.0-2.9	0.2-1.0	.20	.20			
	36-45	16-35	1.55-1.69	0.6-2	0.10-0.15	0.0-2.9	0.2-1.0	.24	.24			
	45-80	16-38	1.60-1.75	0.2-0.6	0.10-0.15	0.0-2.9	0.2-1.0	.24	.24			
LiD:												
Letney--------------	0-6	2-8	1.50-1.65	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	6-31	2-8	1.50-1.65	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20			
	31-75	18-35	1.55-1.70	2-6	0.12-0.17	0.0-2.9	0.1-0.5	.24	.24			
	75-80	18-35	1.55-1.70	2-6	0.12-0.17	0.0-2.9	0.1-0.5	.24	.24			
LnB:												
Lovelady------------	0-6	2-8	1.35-1.50	6-20	0.05-0.10	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	6-32	2-8	1.35-1.55	6-20	0.05-0.10	0.0-2.9	0.1-1.0	.20	.20			
	32-55	15-30	1.30-1.45	0.6-2	0.10-0.15	0.0-2.9	0.1-1.0	.32	.32			
	55-80	18-40	1.35-1.65	0.2-0.6	0.13-0.17	3.0-5.9	0.1-1.0	.32	.32			
LnD:												
Lovelady------------	0-4	2-8	1.35-1.50	6-20	0.05-0.10	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	4-38	2-8	1.35-1.55	6-20	0.05-0.10	0.0-2.9	0.1-1.0	.20	.20			
	38-42	15-30	1.30-1.45	0.6-2	0.10-0.15	0.0-2.9	0.1-1.0	.32	.32			
	42-80	18-40	1.35-1.65	0.2-0.6	0.13-0.17	3.0-5.9	0.1-1.0	.32	.32			
MaE:												
Maben---------------	0-4	5-20	1.40-1.50	0.6-2	0.12-0.16	0.0-2.9	0.5-1.0	.28	.28	3	3	86
	4-28	35-55	1.45-1.55	0.2-0.6	0.14-0.18	6.0-8.9	0.0-0.0	.28	.28			
	28-38	18-27	1.35-1.65	0.2-0.6	0.15-0.20	0.0-2.9	0.0-0.5	.37	.37			
	38-80	---	---	0.2-2	---	---	---	---	---			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
MaG:												
Maben----------------	0-3	5-20	1.40-1.50	0.6-2	0.12-0.16	0.0-2.9	0.5-1.0	.28	.28	3	3	86
	3-30	35-55	1.45-1.55	0.2-0.6	0.14-0.18	6.0-8.9	0.0-0.0	.28	.28			
	30-60	---	---	0.2-2	---	---	---	---	---			
Mf:												
Mattex--------------	0-3	28-32	1.30-1.45	0.6-2	0.12-0.18	0.0-2.9	1.0-3.0	.32	.32	5	8	0
	3-37	15-34	1.30-1.55	0.6-2	0.10-0.18	0.0-2.9	0.1-1.0	.32	.32			
	37-80	35-50	1.40-1.55	0.06-0.2	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
MhC:												
Meth----------------	0-4	5-20	1.30-1.60	0.6-2	0.12-0.18	0.0-2.9	0.5-2.0	.32	.32	5	3	86
	4-8	5-20	1.30-1.60	0.6-2	0.12-0.18	0.0-2.9	0.5-2.0	.32	.32			
	8-43	35-55	1.20-1.65	0.2-0.6	0.15-0.18	3.0-5.9	0.0-0.5	.28	.28			
	43-80	10-35	1.30-1.70	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.32	.32			
Mi:												
Mattex--------------	0-3	15-32	1.30-1.45	0.6-2	0.12-0.18	0.0-2.9	1.0-3.0	.32	.32	5	8	0
	3-37	15-34	1.30-1.55	0.6-2	0.10-0.18	0.0-2.9	0.1-1.0	.32	.32			
	37-80	35-50	1.40-1.55	0.06-0.2	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
Iulus---------------	0-4	6-15	1.20-1.40	0.6-2	0.11-0.18	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	4-37	6-20	1.26-1.45	0.6-2	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32			
	37-80	10-28	1.30-1.50	0.6-2	0.11-0.18	0.0-2.9	0.1-1.0	.32	.32			
MiQ:												
Pits, mine or quarry, gravelly---	0-29	---	---	0.06-20	---	---	---	---	---	5	---	---
MiS:												
Metcalf-------------	0-7	7-22	1.35-1.65	0.6-2	0.12-0.18	0.0-2.9	0.5-2.0	.49	.49	5	5	56
	7-35	18-27	1.35-1.65	0.2-0.6	0.15-0.20	0.0-2.9	0.0-0.5	.37	.37			
	35-80	35-60	1.20-1.60	0.00-0.06	0.15-0.18	6.0-8.9	0.0-0.5	.32	.32			
Sawtown-------------	0-11	4-12	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.37	.37	5	5	56
	11-30	4-12	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.37	.37			
	30-49	15-30	1.30-1.55	0.6-2	0.11-0.16	3.0-5.9	0.5-1.0	.32	.32			
	49-80	35-50	1.20-1.45	0.00-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
MpA:												
Mollville-----------	0-5	16-20	1.40-1.65	0.2-0.6	0.15-0.20	0.0-2.9	0.5-1.0	.37	.37	5	5	56
	5-9	16-20	1.40-1.65	0.2-0.6	0.15-0.20	0.0-2.9	0.5-1.0	.37	.37			
	9-57	20-35	1.50-1.69	0.06-0.2	0.12-0.17	3.0-5.9	0.0-0.5	.32	.32			
	57-76	15-35	1.50-1.69	0.06-0.2	0.15-0.20	3.0-5.9	0.0-0.5	.32	.32			
	76-80	3-12	1.50-1.65	2-6	0.07-0.11	0.0-2.9	0.0-0.5	.20	.20			
Besner--------------	0-7	4-15	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	7-21	4-17	1.20-1.40	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.24	.24			
	21-46	8-18	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
	46-80	10-25	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
MsB:												
Moswell-------------	0-5	5-15	1.25-1.40	0.6-2	0.13-0.18	0.0-2.9	0.5-3.0	.37	.49	5	5	56
	5-13	60-70	1.20-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.2-2.0	.32	.32			
	13-43	60-70	1.20-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.2-1.0	.32	.32			
	43-80	60-75	1.20-1.40	0.00-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.32	.32			
MsD:												
Moswell-------------	0-8	5-15	1.25-1.40	0.6-2	0.13-0.18	0.0-2.9	0.5-3.0	.37	.49	5	5	56
	8-14	60-70	1.20-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.2-2.0	.32	.32			
	14-42	60-70	1.20-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.2-1.0	.32	.32			
	42-80	45-60	1.30-1.40	0.00-0.06	0.12-0.17	9.0-25.0	0.3-1.0	.32	.32			
NaB:												
Naclina-------------	0-6	30-40	1.30-1.40	0.06-0.2	0.14-0.20	6.0-8.9	0.1-1.0	.32	.32	4	4	86
	6-21	40-60	1.40-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
	21-56	40-60	1.40-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
	56-70	40-60	1.40-1.55	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
	70-80	40-60	1.40-1.55	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
NaD:												
Naclina-------------	0-3	40-50	1.30-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.5-2.0	.32	.32	4	4	86
	3-12	40-60	1.40-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
	12-42	40-60	1.40-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
	42-59	40-60	1.40-1.55	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
	59-80	40-60	1.40-1.55	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
NeB:												
Nacogdoches---------	0-7	8-20	1.30-1.60	0.6-2	0.11-0.15	0.0-2.9	0.5-1.0	.32	.32	5	3	86
	7-49	40-60	1.35-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	49-80	30-55	1.40-1.65	0.2-0.6	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
NeE:												
Nacogdoches---------	0-6	20-35	1.30-1.60	0.6-2	0.12-0.17	0.0-2.9	0.5-1.0	.32	.32	5	5	56
	6-60	40-60	1.35-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	60-80	30-55	1.40-1.65	0.2-0.6	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
Ow:												
Owentown------------	0-3	6-18	1.35-1.55	0.6-2	0.11-0.16	0.0-2.9	0.2-1.0	.32	.32	5	3	86
	3-50	6-18	1.40-1.65	0.6-2	0.11-0.16	0.0-2.9	0.2-1.0	.32	.32			
	50-80	5-12	1.40-1.70	2-6	0.07-0.16	0.0-2.9	0.2-1.0	.28	.28			
PeC:												
Penning-------------	0-4	8-15	1.30-1.45	2-6	0.10-0.15	0.0-2.9	0.5-2.0	.37	.37	4	5	56
	4-14	8-15	1.30-1.50	2-6	0.10-0.15	0.0-2.9	0.2-1.0	.37	.37			
	14-48	15-24	1.35-1.55	0.6-2	0.13-0.17	0.0-2.9	0.2-1.0	.32	.32			
	48-56	18-26	1.40-1.65	0.6-2	0.13-0.17	3.0-5.9	0.2-1.0	.32	.32			
	56-80	30-50	1.40-1.69	0.00-0.06	0.08-0.12	6.0-8.9	0.2-1.0	.32	.32			
Kurth---------------	0-7	3-10	1.30-1.45	0.6-2	0.10-0.16	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	7-28	3-10	1.35-1.50	0.6-2	0.10-0.15	0.0-2.9	0.1-1.0	.28	.28			
	28-46	18-35	1.50-1.65	0.6-2	0.11-0.17	3.0-5.9	0.1-1.0	.32	.32			
	46-62	35-45	1.45-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	62-80	15-30	1.60-1.70	0.06-0.2	0.09-0.14	0.0-2.9	0.1-1.0	.32	.32			
PoA:												
Pophers-------------	0-2	15-25	1.20-1.40	0.2-0.6	0.13-0.20	3.0-5.9	0.5-2.0	.37	.32	5	6	48
	2-64	15-35	1.30-1.50	0.2-0.6	0.13-0.20	3.0-5.9	0.2-1.0	.37	.49			
	64-80	20-40	1.35-1.65	0.06-0.2	0.13-0.20	3.0-5.9	0.2-1.0	.37	.49			
RaD:												
Rayburn-------------	0-5	8-20	1.20-1.40	0.6-2	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43	4	3	86
	5-43	40-60	1.30-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	43-52	40-60	1.30-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	52-72	---	---	0.06-0.6	---	---	---	---	---			
RkB:												
Raylake-------------	0-6	45-60	1.30-1.40	0.00-0.06	0.12-0.17	9.0-25.0	0.3-1.0	.32	.32	5	6	48
	6-15	45-60	1.30-1.40	0.00-0.06	0.12-0.17	9.0-25.0	0.3-1.0	.32	.32			
	15-48	45-60	1.30-1.45	0.00-0.06	0.12-0.17	9.0-25.0	0.3-1.0	.32	.32			
	48-61	45-60	1.35-1.55	0.00-0.06	0.08-0.14	6.0-8.9	0.3-1.0	.32	.32			
	61-80	45-60	1.35-1.55	0.00-0.06	0.08-0.14	6.0-8.9	0.3-1.0	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
RkD:												
Raylake-------------	0-3	30-40	1.25-1.40	0.2-0.6	0.11-0.15	3.0-5.9	0.5-2.0	.32	.32	5	6	48
	3-9	45-60	1.30-1.40	0.00-0.06	0.12-0.17	9.0-25.0	0.3-1.0	.32	.32			
	9-58	45-60	1.30-1.45	0.00-0.06	0.12-0.17	9.0-25.0	0.3-1.0	.32	.32			
	58-72	45-60	1.35-1.55	0.00-0.06	0.08-0.14	6.0-8.9	0.3-1.0	.32	.32			
RnB:												
Rentzel-------------	0-3	5-10	1.25-1.35	6-20	0.05-0.09	0.0-2.9	0.1-2.0	.17	.17	5	2	134
	3-28	5-10	1.30-1.55	6-20	0.05-0.09	0.0-2.9	0.1-1.0	.17	.17			
	28-80	15-35	1.40-1.75	0.2-0.6	0.10-0.15	0.0-2.9	0.1-1.0	.32	.32			
RsB:												
Rosenwall-----------	0-4	8-20	1.40-1.60	2-6	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	3	3	86
	4-24	60-75	1.40-1.60	0.00-0.06	0.08-0.14	6.0-8.9	0.5-1.0	.32	.32			
	24-38	40-60	1.40-1.65	0.06-0.6	0.08-0.14	3.0-5.9	0.1-0.5	.32	.32			
	38-80	40-60	1.40-1.65	0.06-0.6	0.08-0.14	3.0-5.9	0.1-0.5	.32	.32			
RsD:												
Rosenwall-----------	0-5	8-20	1.40-1.60	2-6	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	3	3	86
	5-32	60-75	1.40-1.60	0.00-0.06	0.08-0.14	6.0-8.9	0.5-1.0	.32	.32			
	32-60	40-60	1.40-1.65	0.06-0.6	0.08-0.14	3.0-5.9	0.1-0.5	.32	.32			
	60-80	40-60	1.40-1.65	0.06-0.6	0.08-0.14	3.0-5.9	0.1-0.5	.32	.32			
SaB:												
Sacul---------------	0-4	5-20	1.30-1.50	0.6-2	0.09-0.12	0.0-2.9	1.0-3.0	.28	.28	5	3	86
	4-12	2-25	1.40-1.60	0.6-2	0.07-0.17	0.0-2.9	0.5-2.0	.28	.37			
	12-39	40-55	1.40-1.60	0.2-0.6	0.06-0.11	3.0-5.9	0.1-0.5	.28	.28			
	39-53	40-55	1.40-1.60	0.2-0.6	0.06-0.11	3.0-5.9	0.1-0.5	.28	.28			
	53-62	30-55	1.40-1.60	0.2-0.6	0.06-0.11	3.0-5.9	0.1-0.5	.28	.28			
	62-80	15-40	1.30-1.45	0.2-0.6	0.14-0.18	0.0-2.9	0.5-2.0	.28	.37			
SeB:												
Sawlit--------------	0-9	4-12	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.37	.37	5	5	56
	9-12	4-12	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.37	.37			
	12-25	18-30	1.35-1.50	0.6-2	0.13-0.18	0.0-2.9	0.3-1.0	.37	.37			
	25-43	20-35	1.30-1.55	0.6-2	0.13-0.18	3.0-5.9	0.3-1.0	.37	.37			
	43-80	35-50	1.20-1.45	0.00-0.06	0.12-0.17	6.0-8.9	0.3-1.0	.32	.32			
SfA:												
Sawtown-------------	0-4	4-10	1.35-1.50	2-6	0.10-0.16	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	4-30	4-12	1.35-1.50	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.37	.37			
	30-54	15-30	1.30-1.55	0.6-2	0.11-0.16	3.0-5.9	0.5-1.0	.32	.32			
	54-80	35-50	1.20-1.45	0.00-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
SmB:												
Smithdale-----------	0-5	2-15	1.25-1.40	2-6	0.11-0.15	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	5-11	2-15	1.25-1.40	2-6	0.11-0.15	0.0-2.9	0.5-2.0	.28	.28			
	11-36	18-35	1.40-1.70	0.6-2	0.12-0.17	0.0-2.9	0.0-0.5	.28	.28			
	36-80	10-20	1.30-1.70	0.6-2	0.12-0.15	0.0-2.9	0.0-0.5	.28	.32			
TeD:												
Tehran--------------	0-17	2-8	1.50-1.65	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20	5	1	250
	17-73	2-8	1.50-1.65	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20			
	73-80	18-32	1.55-1.70	2-6	0.12-0.17	0.0-2.9	0.1-0.5	.24	.24			
TnB:												
Tenaha--------------	0-4	3-15	1.50-1.65	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.24	3	2	134
	4-24	3-15	1.50-1.65	6-20	0.05-0.10	0.0-2.9	0.1-0.5	.24	.24			
	24-38	15-35	1.50-1.65	0.6-2	0.10-0.15	0.0-2.9	0.1-0.5	.32	.32			
	38-47	15-35	1.50-1.65	0.6-2	0.10-0.15	0.0-2.9	0.1-0.5	.32	.32			
	47-80	20-35	1.60-1.75	0.2-0.6	0.08-0.14	0.0-2.9	0.1-0.5	.32	.32			
TnD:												
Tenaha--------------	0-3	3-15	1.50-1.65	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.24	3	2	134
	3-24	3-15	1.50-1.65	6-20	0.05-0.10	0.0-2.9	0.1-0.5	.24	.24			
	24-40	15-35	1.50-1.65	0.6-2	0.10-0.15	0.0-2.9	0.1-0.5	.32	.32			
	40-51	15-35	1.50-1.65	0.6-2	0.10-0.15	0.0-2.9	0.1-0.5	.32	.32			
	51-80	20-35	1.60-1.75	0.2-0.6	0.08-0.14	0.0-2.9	0.1-0.5	.32	.32			
TnG:												
Tenaha--------------	0-3	3-15	1.50-1.65	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.17	.24	3	2	134
	3-21	3-15	1.50-1.65	6-20	0.05-0.10	0.0-2.9	0.1-0.5	.24	.24			
	21-43	15-35	1.50-1.65	0.6-2	0.10-0.15	0.0-2.9	0.1-0.5	.32	.32			
	43-80	20-35	1.60-1.75	0.2-0.6	0.08-0.14	0.0-2.9	0.1-0.5	.32	.32			
TsB:												
Tonkawa-------------	0-15	2-8	1.30-1.55	6-20	0.04-0.07	0.0-2.9	0.1-2.0	.15	.15	5	1	310
	15-80	2-8	1.30-1.55	6-20	0.04-0.07	0.0-2.9	0.1-1.0	.15	.15			
TsD:												
Tonkawa-------------	0-7	2-8	1.30-1.55	6-20	0.04-0.07	0.0-2.9	0.1-2.0	.15	.15	5	1	310
	7-80	2-8	1.30-1.55	6-20	0.04-0.07	0.0-2.9	0.1-1.0	.15	.15			

Table 28.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
Tu:												
Tuscosso------------	0-5	18-40	1.10-1.50	0.6-2	0.13-0.20	2.0-5.9	0.5-2.0	.28	.28	5	4	86
	5-40	35-55	1.20-1.50	0.2-0.6	0.12-0.18	6.0-8.9	0.3-2.0	.32	.32			
	40-80	35-55	1.20-1.50	0.2-0.6	0.12-0.18	6.0-8.9	0.3-2.0	.32	.32			
TuD:												
Trawick-------------	0-6	27-35	1.30-1.50	0.6-2	0.07-0.15	0.0-2.9	0.5-2.0	.20	.32	3	8	0
	6-35	35-50	1.30-1.50	0.2-0.6	0.10-0.17	3.0-5.9	0.1-0.5	.32	.32			
	35-41	35-50	1.30-1.50	0.2-0.6	0.10-0.17	3.0-5.9	0.1-0.5	.32	.32			
	41-80	---	---	0.2-2	---	---	---	---	---			
TuG:												
Trawick-------------	0-3	27-35	1.25-1.45	0.6-2	0.11-0.15	0.0-2.9	0.5-2.0	.32	.37	3	3	86
	3-20	35-50	1.30-1.50	0.2-0.6	0.10-0.17	3.0-5.9	0.1-0.5	.32	.32			
	20-37	35-50	1.30-1.50	0.2-0.6	0.10-0.17	3.0-5.9	0.1-0.5	.32	.32			
	37-80	---	---	0.2-2	---	---	---	---	---			
WeB:												
Woden---------------	0-5	5-15	1.25-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.20	.20	5	3	86
	5-12	5-15	1.25-1.40	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.20	.20			
	12-80	8-18	1.35-1.60	2-6	0.12-0.18	0.0-2.9	0.1-1.0	.20	.20			
W:												
Water---------------	---	---	---	---	---	---	---	---	---	-	---	---

Table 29.--Chemical Soil Properties

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
AaB:								
Alazan---------------	0-3	2.0-5.0	---	4.5-6.0	0	0	0	0
	3-12	2.0-5.0	---	4.5-5.5	0	0	0	0
	12-20	5.0-15	---	4.5-5.5	0	0	0	0
	20-26	---	20-40	4.5-6.5	0	0	0	0
	26-80	---	20-40	4.5-6.5	0	0	0	0
AbA:								
Alazan---------------	0-5	---	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	5-11	---	2.0-10	4.5-5.5	0	0	0.0-2.0	0
	11-37	---	5.0-15	4.5-5.5	0	0	0.0-2.0	0
	37-80	20-40	---	4.5-6.5	0	0	0.0-2.0	0
Besner---------------	0-24	2.0-5.0	---	4.5-6.5	0	0	0	0
	24-53	3.0-10	---	4.5-6.5	0	0	0	0
	53-80	3.0-10	---	4.5-6.5	0	0	0	0
AtA:								
Alto-----------------	0-7	4.0-10	---	5.6-6.5	0	0	0	0
	7-41	15-35	---	5.1-6.5	0	0	0	0
	41-58	15-35	---	5.1-7.3	0	0	0	0
	58-80	20-40	---	5.6-7.3	0	0	0	0
AtB:								
Attoyac--------------	0-5	2.0-8.0	---	5.1-6.5	0	0	0	0
	5-10	2.0-8.0	---	5.1-6.5	0	0	0	0
	10-80	---	4.0-15	4.5-6.0	0	0	0	0
AuD:								
Austonio-------------	0-8	5.0-12	---	5.1-6.5	0	0	0.0-2.0	0
	8-16	5.0-12	---	4.5-6.5	0	0	0.0-2.0	0
	16-70	---	10-20	4.5-6.0	0	0	0.0-2.0	0
	70-80	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
BaB:								
Bernaldo-------------	0-5	2.0-5.0	---	5.1-6.5	0	0	0	0
	5-15	4.0-7.0	---	5.1-6.5	0	0	0	0
	15-41	10-20	---	4.5-6.5	0	0	0	0
	41-80	5.0-15	---	4.5-6.5	0	0	0	0
BeA:								
Besner---------------	0-6	2.0-5.0	---	4.5-6.5	0	0	0	0
	6-25	2.0-5.0	---	4.5-6.5	0	0	0	0
	25-62	3.0-10	---	4.5-6.5	0	0	0	0
	62-80	3.0-10	---	4.5-6.5	0	0	0	0
BfA:								
Betis----------------	0-7	---	1.0-5.0	4.5-6.0	0	0	0	0
	7-28	---	1.0-5.0	4.5-6.0	0	0	0	0
	28-80	---	1.0-5.0	4.5-6.0	0	0	0	0
BoC:								
Bowie----------------	0-9	2.0-10	---	4.5-6.5	0	0	0	0
	9-17	2.0-10	---	4.5-6.5	0	0	0	0
	17-25	---	5.0-15	4.5-5.5	0	0	0	0
	25-80	---	5.0-18	4.5-5.5	0	0	0	0

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
BuB:								
Bub------------------	0-4	3.0-15	---	5.6-6.5	0	0	0	0
	4-18	---	15-25	4.5-6.5	0	0	0.0-2.0	0
	18-80	---	---	---	---	---	---	---
ChA:								
Chireno--------------	0-7	10-25	---	5.6-7.3	0	0	0.0-2.0	0
	7-33	13-30	---	6.1-7.8	0	0	0.0-2.0	0
	33-50	13-30	---	6.1-7.8	0	0	0.0-2.0	0
	50-80	13-30	---	6.1-7.8	0	0	0.0-2.0	0
CoB:								
Corrigan-------------	0-6	---	15-25	4.5-6.0	0	0	0	0
	6-14	---	15-25	4.5-6.0	0	0	0	0
	14-39	---	25-40	3.6-5.5	0-2	0	0.0-2.0	0-4
	39-80	---	---	---	---	---	---	---
CrG:								
Cuthbert-------------	0-2	3.0-15	---	5.6-7.3	0	0	0	0
	2-22	---	10-20	3.6-5.5	0	0	0	0
	22-80	---	10-20	3.6-5.5	0	0	0	0
CtE:								
Cuthbert-------------	0-6	3.0-9.0	---	4.5-6.5	0	0	0	0
	6-10	3.0-9.0	---	4.5-6.5	0	0	0	0
	10-37	---	10-20	3.6-5.5	0	0	0	0
	37-80	---	1.0-5.0	3.6-5.0	0	0	0	0
CtG:								
Cuthbert-------------	0-6	3.0-9.0	---	4.5-6.5	0	0	0	0
	6-10	3.0-9.0	---	4.5-6.5	0	0	0	0
	10-33	---	10-20	3.6-5.5	0	0	0	0
	33-80	---	5.0-15	3.6-5.5	0	0	0	0
CtS:								
Cuthbert-------------	0-3	3.0-9.0	---	4.5-6.5	0	0	0	0
	3-30	---	10-20	3.6-5.5	0	0	0	0
	30-80	---	1.0-5.0	3.6-5.0	0	0	0	0
CuE:								
Cuthbert-------------	0-6	3.0-9.0	---	4.5-6.5	0	0	0	0
	6-31	---	10-20	3.6-5.5	0	0	0	0
	31-37	---	5.0-15	3.6-5.5	0	0	0	0
	37-80	---	10-20	3.6-5.0	0	0	0	0
DaC:								
Darco----------------	0-9	1.0-3.0	---	4.5-6.5	0	0	0	0
	9-70	1.0-3.0	---	4.5-6.5	0	0	0	0
	70-80	3.0-10	---	4.5-6.5	0	0	0	0
DaE:								
Darco----------------	0-6	1.0-3.0	---	4.5-6.5	0	0	0	0
	6-49	1.0-3.0	---	4.5-6.5	0	0	0	0
	49-61	3.0-10	---	4.5-6.5	0	0	0	0
	61-80	3.0-10	---	4.5-6.5	0	0	0	0
DsA:								
Dreka----------------	0-9	10-25	---	5.6-7.8	0	0	0.0-2.0	0
	9-43	10-20	---	5.6-7.8	0	0	0.0-2.0	0-2
	43-80	15-30	---	5.6-7.8	0	0	0.0-4.0	0-4

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
EeB:								
Eastwood-------------	0-7	---	10-20	4.5-6.0	0	0	0	0
	7-10	---	10-20	4.5-6.0	0	0	0	0
	10-19	---	15-50	3.6-5.5	0	0	0	0-2
	19-55	---	15-50	3.6-5.5	0	0	0	0-2
	55-80	15-50	---	4.5-7.3	0	0-5	0.0-4.0	0-8
EeD:								
Eastwood-------------	0-4	---	10-20	4.5-6.0	0	0	0	0
	4-47	---	15-50	3.6-5.5	0	0	0	0-2
	47-80	15-50	---	4.5-7.3	0	0-5	0.0-4.0	0-8
ElA:								
Eastwood-------------	0-6	---	10-20	4.5-6.0	0	0	0	0
	6-35	---	15-50	3.6-5.5	0	0	0	0-2
	35-43	---	15-50	3.6-6.5	0	0-5	0.0-2.0	0-4
	43-80	15-50	---	4.5-7.3	0	0-5	0.0-4.0	0-8
Latex----------------	0-14	---	2.0-15	4.5-6.0	0	0	0	0
	14-31	---	2.0-15	4.5-5.5	0	0	0	0
	31-39	---	2.0-15	4.5-5.5	0	0	0	0
	39-80	---	12-40	4.5-5.0	0	0	0	0
EtB:								
Etoile---------------	0-8	3.0-10	---	5.1-6.5	0	0	0	0
	8-32	40-60	---	5.1-6.0	0	0	0	0
	32-51	40-60	---	5.6-7.8	0-2	0	0	0
	51-80	40-60	---	6.1-8.4	0-5	0	0	0
EtD:								
Etoile---------------	0-4	3.0-10	---	5.1-6.5	0	0	0	0
	4-43	40-60	---	5.1-6.0	0	0	0	0
	43-80	40-60	---	6.1-8.4	0-5	0	0	0
GaA:								
Gallime--------------	0-4	5.0-15	---	5.1-6.5	0	0	0	0
	4-25	5.0-15	---	5.1-6.5	0	0	0	0
	25-80	---	15-35	4.5-6.0	0	0	0	0
Alazan---------------	0-3	2.0-5.0	---	4.5-6.5	0	0	0	0
	3-12	2.0-5.0	---	4.5-6.5	0	0	0	0
	12-80	5.0-15	---	4.5-6.5	0	0	0	0
GaB:								
Gallime--------------	0-3	5.0-15	---	5.1-6.5	0	0	0	0
	3-20	5.0-15	---	5.1-6.5	0	0	0	0
	20-80	---	15-35	4.5-6.0	0	0	0	0
GaC:								
Gallime--------------	0-27	4.0-7.0	---	5.1-6.5	0	0	0.0-2.0	0
	27-45	5.0-15	---	5.1-6.5	0	0	0	0
	45-80	---	15-35	4.5-6.0	0	0	0	0
Guyton---------------	0-5	---	4.0-10	3.6-6.0	0	0	0	0
	5-11	---	4.0-10	3.6-6.0	0	0	0	0
	11-26	---	10-30	3.6-6.0	0	0	0	0
	26-49	---	10-30	3.6-6.0	0	0	0	0
	49-80	---	10-30	3.6-6.0	0	0	0	0
GrB:								
Grapeland------------	0-6	---	2.0-6.0	3.5-5.5	0	0	0.0-2.0	0
	6-80	---	2.0-8.0	3.5-5.5	0	0	0.0-2.0	0

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
GtA:								
Guyton	0-7	---	1.6-8.3	4.5-6.0	0	0	0	0
	7-16	---	1.6-8.3	4.5-6.0	0	0	0	0
	16-80	---	5.9-12	4.5-6.0	0	0	0	0
GuA:								
Guyton	0-16	---	4.0-10	3.6-6.0	0	0	0	0
	16-32	---	10-30	3.6-6.0	0	0	0	0
	32-80	10-30	---	3.6-6.0	0	0	0	0
Sawtown	0-24	---	4.0-10	4.5-6.0	0	0	0	0
	24-42	---	10-20	3.6-6.0	0	0	0	0
	42-80	---	20-40	3.6-6.5	0	0-5	0.0-4.0	0-4
HaA:								
Hainesville	0-2	5.0-15	---	4.5-6.5	0	0	0	0
	2-7	5.0-15	---	4.5-6.5	0	0	0	0
	7-22	2.0-15	---	4.5-6.5	0	0	0	0
	22-80	---	2.0-15	4.5-6.0	0	0	0	0
Hc:								
Hannahatchee	0-4	5.0-10	---	5.1-7.3	0	0	0	0
	4-25	5.0-15	---	5.6-7.3	0	0	0	0
	25-80	5.0-20	---	5.6-7.3	0	0	0	0
HeB:								
Herty	0-2	---	3.0-12	4.5-6.0	0	0	0.0-2.0	0-4
	2-7	---	3.0-12	4.5-6.0	0	0	0.0-2.0	0-4
	7-20	---	15-25	3.6-5.5	0	0-2	0.0-4.0	6-13
	20-31	---	20-40	3.6-5.5	0	2-35	2.0-8.0	8-13
	31-45	---	20-40	3.6-6.0	0	2-35	2.0-8.0	8-13
	45-60	---	20-40	3.6-6.5	0	2-35	4.0-8.0	8-13
Ia:								
Iulus	0-10	---	5.0-10	4.5-6.0	0	0	0	0
	10-46	---	2.0-10	4.5-6.0	0	0	0	0
	46-80	---	5.0-15	4.5-6.0	0	0	0	0
Iu:								
Iulus	0-8	---	5.0-10	4.5-6.0	0	0	0	0
	8-24	---	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	24-80	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0
KhB:								
Kirvin	0-3	3.0-9.0	---	5.0-6.0	0	0	0	0
	3-12	3.0-9.0	---	5.0-6.0	0	0	0	0
	12-40	---	10-25	3.6-5.5	0	0	0	0
	40-51	---	10-25	3.6-5.0	0	0	0	0
	51-57	---	10-20	3.6-5.5	0	0	0	0
	57-80	---	---	3.6-5.5	---	---	---	---
KiC:								
Kirvin	0-7	3.0-9.0	---	4.5-6.5	0	0	0	0
	7-34	---	10-25	3.6-5.5	0	0	0	0
	34-46	---	10-25	3.6-5.0	0	0	0	0
	46-80	---	10-20	3.6-5.0	0	0	0	0
KiD:								
Kirvin	0-3	3.0-9.0	---	4.5-6.5	0	0	0	0
	3-40	---	10-25	3.6-5.0	0	0	0	0
	40-80	---	10-20	3.6-5.0	0	0	0	0

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
KkD:								
Kisatchie------------	0-3	---	15-25	4.5-5.5	0	0	0	0
	3-5	---	15-25	4.5-5.5	0	0	0	0
	5-26	---	25-40	3.6-5.0	0	0	0	0
	26-80	---	---	---	---	---	---	---
KuB:								
Kurth----------------	0-8	1.0-5.0	---	5.1-6.5	0	0	0	0
	8-26	1.0-5.0	---	5.1-6.5	0	0	0	0
	26-50	5.0-15	---	5.1-6.0	0	0	0	0
	50-61	---	20-40	3.6-5.5	0	0-2	0.0-2.0	0
	61-80	---	10-25	3.6-5.5	0	0-2	0.0-2.0	0-2
KwA:								
Kawah----------------	0-22	1.0-5.0	---	5.1-6.5	0	0	0	0
	22-80	---	1.0-5.0	3.6-6.0	0	0	0	0
La:								
Laneville------------	0-13	5.0-15	---	5.1-6.5	0	0	0	0
	13-42	---	10-20	3.6-5.5	0	0	0.0-2.0	0-2
	42-80	---	15-30	3.6-6.0	0	0	0.0-4.0	0-4
LaB:								
LaCerda--------------	0-3	---	30-40	4.5-6.0	0	0	0.0-2.0	0
	3-60	40-65	---	4.5-7.3	0-5	0	0.0-2.0	0
	60-80	40-65	---	5.6-8.4	0-15	0-2	0.0-2.0	0
LaE:								
LaCerda--------------	0-2	---	30-40	4.5-6.0	0	0	0.0-2.0	0
	2-44	40-65	---	4.5-7.3	0-5	0	0.0-2.0	0
	44-80	40-65	---	5.6-8.4	0-15	0-2	0.0-2.0	0
Lb:								
Laneville------------	0-7	5.0-15	---	5.1-6.5	0	0	0	0
	7-24	5.0-15	---	5.1-6.5	0	0	0	0
	24-35	---	10-20	3.6-5.5	0	0	0.0-2.0	0-2
	35-80	---	15-30	3.6-6.0	0	0	0.0-4.0	0-4
LdB:								
Latex----------------	0-7	---	2.0-15	4.5-6.0	0	0	0	0
	7-11	---	2.0-15	4.5-6.0	0	0	0	0
	11-30	---	2.0-15	4.5-5.5	0	0	0	0
	30-55	---	2.0-15	4.5-5.5	0	0	0	0
	55-80	---	12-40	4.5-5.0	0	0	0	0
LiB:								
Letney---------------	0-3	---	1.0-3.0	4.5-6.0	0	0	0.0-2.0	0
	3-24	---	1.0-3.0	4.5-6.0	0	0	0.0-2.0	0
	24-80	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0
LiC:								
Lilbert--------------	0-3	---	5.0-10	4.5-6.5	0	0	0	0
	3-36	---	5.0-10	4.5-6.5	0	0	0	0
	36-45	---	10-25	4.5-6.0	0	0	0	0
	45-80	---	10-25	4.5-6.0	0	0	0	0
LiD:								
Letney---------------	0-6	---	1.0-3.0	4.5-6.0	0	0	0.0-2.0	0
	6-31	---	1.0-3.0	4.5-6.0	0	0	0.0-2.0	0
	31-75	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0
	75-80	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
LnB:								
Lovelady-------------	0-6	---	1.0-5.0	4.5-6.0	0	0	0	0
	6-32	---	1.0-5.0	4.5-6.0	0	0	0	0
	32-55	---	5.0-15	4.5-6.0	0	0	0	0
	55-80	---	5.0-20	3.6-5.5	0	0	0	0
LnD:								
Lovelady-------------	0-4	---	1.0-5.0	4.5-6.0	0	0	0	0
	4-38	---	1.0-5.0	4.5-6.0	0	0	0	0
	38-42	---	5.0-15	4.5-6.0	0	0	0	0
	42-80	---	5.0-20	3.6-5.5	0	0	0	0
MaE:								
Maben----------------	0-4	2.7-11	---	4.5-6.5	0	0	0	0
	4-28	---	18-30	4.5-6.0	0	0	0	0
	28-38	---	10-30	3.6-6.0	0	0	0	0
	38-80	---	---	---	---	---	---	---
MaG:								
Maben----------------	0-3	2.7-11	---	4.5-6.5	0	0	0	0
	3-30	---	18-30	4.5-6.0	0	0	0	0
	30-60	---	---	---	---	---	---	---
Mf:								
Mattex---------------	0-3	---	5.0-20	4.5-6.0	0	0	0.0-2.0	0
	3-37	---	5.0-20	3.6-5.5	0	0	0.0-2.0	0
	37-80	---	10-25	4.5-6.0	0	0	0.0-2.0	0
MhC:								
Meth-----------------	0-4	2.0-10	---	5.1-6.5	0	0	0	0
	4-8	2.0-10	---	5.1-6.5	0	0	0	0
	8-43	---	15-40	4.5-6.0	0	0	0	0
	43-80	---	5.0-25	4.5-6.0	0	0	0	0
Mi:								
Mattex---------------	0-3	---	5.0-20	4.5-6.0	0	0	0.0-2.0	0
	3-37	---	5.0-20	3.6-5.5	0	0	0.0-2.0	0
	37-80	---	10-25	4.5-6.0	0	0	0.0-2.0	0
Iulus----------------	0-4	---	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	4-37	---	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	37-80	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0
MiQ:								
Pits, mine or quarry, gravelly------------	0-29	---	---	---	0	0	0	0
MiS:								
Metcalf--------------	0-7	---	5.0-15	3.6-6.0	0	0	0	0
	7-35	---	10-30	3.6-6.0	0	0	0	0
	35-80	---	20-50	3.6-6.0	0	0	0	0
Sawtown--------------	0-11	---	4.0-10	4.5-6.0	0	0	0	0
	11-30	---	4.0-10	4.5-6.0	0	0	0	0
	30-49	---	10-20	3.6-6.0	0	0	0	0
	49-80	---	20-40	3.6-6.5	0	0-5	0.0-4.0	0-4

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
MpA:								
Mollville------------	0-5	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0-2
	5-9	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0-2
	9-57	---	15-25	4.5-6.0	0	0	0.0-4.0	2-10
	57-76	10-25	---	4.5-7.3	0-2	0-3	0.0-4.0	2-10
	76-80	5.0-10	---	5.1-7.8	0-2	0-3	0.0-4.0	2-10
Besner---------------	0-7	2.0-5.0	---	4.5-6.5	0	0	0	0
	7-21	2.0-5.0	---	4.5-6.5	0	0	0	0
	21-46	3.0-10	---	4.5-6.5	0	0	0	0
	46-80	3.0-10	---	4.5-6.5	0	0	0	0
MsB:								
Moswell--------------	0-5	---	5.0-18	4.5-6.0	0	0	0.0-2.0	0
	5-13	---	30-45	3.6-5.5	0	0	0.0-2.0	0-4
	13-43	---	30-45	3.6-5.5	0	5-15	2.0-8.0	4-12
	43-80	---	30-45	3.6-5.5	0	0-5	2.0-8.0	4-12
MsD:								
Moswell--------------	0-8	---	5.0-18	4.5-6.0	0	0	0.0-2.0	0
	8-14	---	30-45	3.6-5.5	0	0	0.0-2.0	0-4
	14-42	---	30-45	3.6-5.5	0	5-15	2.0-8.0	4-12
	42-80	---	35-55	3.6-5.5	0	0	0.0-2.0	0
NaB:								
Naclina--------------	0-6	---	30-40	4.5-6.0	0	0	0.0-2.0	0
	6-21	35-50	---	5.1-7.3	0-10	0	0.0-2.0	0
	21-56	35-50	---	5.1-8.4	0-10	0	0.0-2.0	0
	56-70	35-50	---	7.4-9.0	5-25	0	0.0-2.0	0
	70-80	35-50	---	7.4-9.0	5-25	0	0.0-2.0	0
NaD:								
Naclina--------------	0-3	35-45	---	5.6-7.3	0	0	0.0-2.0	0
	3-12	35-50	---	5.1-7.3	0-10	0	0.0-2.0	0
	12-42	35-50	---	5.1-8.4	0-10	0	0.0-2.0	0
	42-59	35-50	---	7.4-9.0	5-25	0	0.0-2.0	0
	59-80	35-50	---	7.4-9.0	5-25	0	0.0-2.0	0
NeB:								
Nacogdoches----------	0-7	1.0-5.0	---	5.1-6.5	0	0	0	0
	7-49	---	15-25	4.5-5.5	0	0	0	0
	49-80	15-25	---	5.1-7.8	0-6	0	0	0
NeE:								
Nacogdoches----------	0-6	4.0-10	---	5.1-6.5	0	0	0	0
	6-60	---	15-25	4.5-5.5	0	0	0	0
	60-80	15-25	---	5.1-7.8	0-6	0	0	0
Ow:								
Owentown-------------	0-3	5.0-15	---	5.1-6.0	0	0	0.0-2.0	0
	3-50	5.0-20	---	5.1-6.0	0	0	0.0-2.0	0
	50-80	5.0-15	---	5.1-6.0	0	0	0.0-2.0	0

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
PeC:								
Penning	0-4	---	5.0-10	4.5-6.0	0	0	0	0
	4-14	---	5.0-10	4.5-6.0	0	0	0	0
	14-48	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
	48-56	5.0-20	---	4.5-6.5	0	0	0.0-4.0	2-6
	56-80	10-35	---	4.5-7.3	0	0	2.0-8.0	4-10
Kurth	0-7	1.0-5.0	---	5.1-6.5	0	0	0	0
	7-28	1.0-5.0	---	5.1-6.0	0	0	0	0
	28-46	5.0-15	---	5.1-6.0	0	0	0	0
	46-62	---	20-40	3.5-5.5	0	0-2	0.0-2.0	0
	62-80	---	10-25	3.6-5.5	0	0-2	0.0-2.0	0-2
PoA:								
Pophers	0-2	---	15-28	4.5-6.0	0	0-2	0.0-4.0	0-4
	2-64	---	7.0-20	3.6-5.5	0	0-4	0.0-4.0	2-12
	64-80	---	7.0-25	3.6-5.5	0	2-6	4.0-8.0	4-16
RaD:								
Rayburn	0-5	---	1.0-7.0	4.5-6.0	0	0	0	0
	5-43	---	25-35	3.6-5.5	0	0	0	0
	43-52	---	25-35	3.6-5.5	0	0	0	0
	52-72	---	---	---	---	---	---	---
RkB:								
Raylake	0-6	---	35-55	4.5-6.0	0	0	0.0-2.0	0
	6-15	---	35-55	3.6-6.0	0	0	0.0-2.0	0
	15-48	---	35-55	3.6-6.0	0	0	0.0-4.0	0-4
	48-61	---	35-55	4.5-8.4	0-10	0-4	2.0-8.0	0-6
	61-80	---	35-55	4.5-8.4	0-10	0-4	2.0-8.0	0-6
RkD:								
Raylake	0-3	---	25-35	4.5-6.0	0	0	0.0-2.0	0
	3-9	---	35-55	3.5-5.0	0	0	0.0-2.0	0
	9-58	35-55	---	4.5-6.5	0	0	0.0-4.0	0-4
	58-72	35-55	---	4.5-8.4	0-10	0-4	2.0-8.0	0-6
RnB:								
Rentzel	0-3	1.0-5.0	---	3.6-6.0	0	0	0	0
	3-28	1.0-5.0	---	3.6-6.0	0	0	0	0
	28-80	---	3.0-10	3.6-5.5	0	0	0	0
RsB:								
Rosenwall	0-4	1.0-5.0	---	4.5-6.5	0	0	0	0
	4-24	---	25-35	4.5-6.0	0	0	0	0
	24-38	---	1.0-5.0	3.6-6.0	0	0	0	0
	38-80	---	1.0-5.0	3.6-5.5	0	0	0	0
RsD:								
Rosenwall	0-5	1.0-5.0	---	4.5-6.5	0	0	0	0
	5-32	---	25-35	4.5-6.0	0	0	0	0
	32-60	---	1.0-5.0	3.6-6.0	0	0	0	0
	60-80	---	1.0-5.0	3.6-5.5	0	0	0	0
SaB:								
Sacul	0-4	---	5.0-15	4.5-6.0	0	0	0	0
	4-12	---	5.0-15	4.5-6.0	0	0	0	0
	12-39	20-28	---	4.5-6.0	0	0	0	0
	39-53	20-28	---	4.5-6.0	0	0	0	0
	53-62	20-28	---	4.5-6.0	0	0	0	0
	62-80	---	15-40	3.6-5.5	0	0	0	0

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
SeB:								
Sawlit---------------	0-9	---	4.0-10	4.5-6.0	0	0	0	0
	9-12	---	4.0-10	4.5-6.0	0	0	0	0
	12-25	---	20-40	4.5-6.0	0	0	0	0
	25-43	---	20-40	4.5-6.0	0	0	0	0
	43-80	---	35-50	3.6-5.5	0	0-5	0	0-4
SfA:								
Sawtown--------------	0-4	4.0-8.0	---	4.5-6.5	0	0	0	0
	4-30	---	4.0-10	4.5-6.0	0	0	0	0
	30-54	---	10-20	3.6-6.0	0	0	0	0
	54-80	---	20-40	3.6-6.5	0	0-5	0.0-4.0	0-4
SmB:								
Smithdale------------	0-5	---	0.3-2.9	4.5-6.5	0	0	0.0-2.0	0
	5-11	---	0.3-2.9	4.5-6.5	0	0	0.0-2.0	0
	11-36	---	10-30	4.5-6.0	0	0	0	0
	36-80	---	2.0-10	4.5-6.0	0	0	0	0
TeD:								
Tehran---------------	0-17	---	1.0-3.0	4.5-6.0	0	0	0	0
	17-73	---	1.0-3.0	4.5-6.0	0	0	0	0
	73-80	---	5.0-15	4.5-6.0	0	0	0	0
TnB:								
Tenaha---------------	0-4	---	1.0-5.0	4.5-6.0	0	0	0	0
	4-24	---	1.0-5.0	4.5-6.0	0	0	0	0
	24-38	---	5.0-20	3.6-5.5	0	0	0	0
	38-47	---	5.0-20	3.6-5.5	0	0	0	0
	47-80	---	5.0-20	3.6-5.5	0	0	0	0
TnD:								
Tenaha---------------	0-3	---	1.0-5.0	4.5-6.0	0	0	0	0
	3-24	---	1.0-5.0	4.5-6.0	0	0	0	0
	24-40	---	5.0-20	3.6-5.5	0	0	0	0
	40-51	---	5.0-20	3.6-5.5	0	0	0	0
	51-80	---	5.0-20	3.6-5.5	0	0	0	0
TnG:								
Tenaha---------------	0-3	---	1.0-5.0	4.5-6.0	0	0	0	0
	3-21	---	1.0-5.0	4.5-6.0	0	0	0	0
	21-43	---	5.0-20	3.6-5.5	0	0	0	0
	43-80	---	5.0-20	3.6-5.5	0	0	0	0
TsB:								
Tonkawa--------------	0-15	---	3.0-12	3.6-6.0	0	0	0	0
	15-80	---	3.0-12	3.6-5.5	0	0	0	0
TsD:								
Tonkawa--------------	0-7	---	3.0-12	3.6-6.0	0	0	0	0
	7-80	---	3.0-12	3.6-5.5	0	0	0	0
Tu:								
Tuscosso-------------	0-5	25-40	---	4.5-7.3	0	0	0	0
	5-40	---	25-45	4.5-6.0	0	0	0	0
	40-80	25-45	---	4.5-6.0	0	0	0	0

Table 29.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
TuD:								
Trawick	0-6	3.0-15	---	5.6-7.3	0	0	0	0
	6-35	10-30	---	5.1-7.3	0	0	0	0
	35-41	10-30	---	5.1-7.8	0	0	0	0
	41-80	---	---	---	---	---	---	---
TuG:								
Trawick	0-3	3.0-15	---	5.6-7.3	0	0	0	0
	3-20	10-30	---	5.1-7.3	0	0	0	0
	20-37	10-30	---	5.1-7.8	0	0	0	0
	37-80	---	---	---	---	---	---	---
WeB:								
Woden	0-5	1.0-5.0	---	5.1-6.5	0	0	0	0
	5-12	1.0-5.0	---	5.1-6.5	0	0	0	0
	12-80	3.0-12	---	5.1-6.5	0	0	0	0
W:								
Water	---	---	---	---	---	---	---	---

Table 30.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
AaB:										
Alazan	C	Very low	Jan-Apr	1.5-2.5	>6.0	---	---	None	---	None
			May-Dec	---	---	---	---	None	---	None
AbA:										
Alazan	C	Low	Jan-May	1.5-2.5	>6.0	---	---	None	---	None
			Jun-Dec	---	---	---	---	None	---	None
Besner	B	Low	Jan-Feb	4.0-6.0	>6.0	---	---	None	---	None
			Mar-Dec	---	---	---	---	None	---	None
AtA:										
Alto	C	Very low	Jan-Mar	2.5-4.0	3.0-4.5	---	---	None	---	None
			Apr-Dec	---	---	---	---	None	---	None
AtB:										
Attoyac	B	Very low	Jan-Dec	---	---	---	---	None	---	None
AuD:										
Austonio	B	Medium	Jan-Dec	---	---	---	---	None	---	None
BaB:										
Bernaldo	B	Very low	Jan-Mar	4.0-6.0	4.5-6.0	---	---	None	---	None
			Apr-Nov	---	---	---	---	None	---	None
			Dec	4.0-6.0	4.5-6.0	---	---	None	---	None
BeA:										
Besner	B	Low	Jan-Feb	4.0-6.0	>6.0	---	---	None	---	None
			Mar-Dec	---	---	---	---	None	---	None
BfA:										
Betis	A	Very low	Jan-Dec	---	---	---	---	None	---	None
BoC:										
Bowie	C	Low	Jan-Apr	3.5-5.0	4.0-6.0	---	---	None	---	None
			May-Dec	---	---	---	---	None	---	None

Table 30.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
BuB:										
Bub	D	High	Jan-Dec	---	---	---	---	None	---	None
ChA:										
Chireno	C	Very low	Jan-Apr	3.5-5.0	>6.0	---	---	None	---	None
			May-Dec	---	---	---	---	None	---	None
CoB:										
Corrigan	D	Medium	Jan-Mar	1.0-2.5	1.5-3.5	---	---	None	---	None
			Apr-Nov	---	---	---	---	None	---	None
			Dec	1.0-2.5	1.5-3.5	---	---	None	---	None
CrG:										
Cuthbert	C	Medium	Jan-Dec	---	---	---	---	None	---	None
CtE:										
Cuthbert	C	Medium	Jan-Dec	---	---	---	---	None	---	None
CtG:										
Cuthbert	C	High	Jan-Dec	---	---	---	---	None	---	None
CtS:										
Cuthbert	C	Medium	Jan-Dec	---	---	---	---	None	---	None
CuE:										
Cuthbert	C	Medium	Jan-Dec	---	---	---	---	None	---	None
DaC:										
Darco	A	Low	Jan-Dec	---	---	---	---	None	---	None
DaE:										
Darco	A	Medium	Jan-Dec	---	---	---	---	None	---	None
DsA:										
Dreka	C/D	Negligible	Jan-May	0.5-2.5	>6.0	---	---	None	Long	Frequent
			Jun-Oct	---	---	---	---	None	---	---
			Nov-Dec	0.5-2.5	>6.0	---	---	None	Long	Frequent
EeB:										
Eastwood	D	Medium	Jan-Dec	---	---	---	---	None	---	None

Table 30.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
EeD:										
Eastwood	D	Very high	Jan-Dec	---	---	---	---	None	---	None
ElA:										
Eastwood	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Latex	C	Low	Jan-Apr	3.0-4.5	3.5-5.0	---	---	None	---	None
			May-Nov	---	---	---	---	None	---	None
			Dec	3.0-4.5	3.5-5.0	---	---	None	---	None
EtB:										
Etoile	D	Medium	Jan-Dec	---	---	---	---	None	---	None
EtD:										
Etoile	D	Very high	Jan-Dec	---	---	---	---	None	---	None
GaA:										
Gallime	B	Very low	Jan-Mar	4.0-6.0	4.5-6.0	---	---	None	---	None
			Apr-Nov	---	---	---	---	None	---	None
			Dec	4.0-6.0	4.5-6.0	---	---	None	---	None
Alazan	C	Very low	Jan-Apr	1.5-2.5	>6.0	---	---	None	---	None
			May-Dec	---	---	---	---	None	---	None
GaB:										
Gallime	B	Very low	Jan-Mar	4.0-6.0	4.5-6.0	---	---	None	---	None
			Apr-Nov	---	---	---	---	None	---	None
			Dec	4.0-6.0	4.5-6.0	---	---	None	---	None
GaC:										
Gallime	A	Very low	Jan-Mar	4.0-6.0	4.5-6.0	---	---	None	---	None
			Apr-Nov	---	---	---	---	None	---	None
			Dec	4.0-6.0	4.5-6.0	---	---	None	---	None
Guyton	C/D	Negligible	Jan-May	0.0-1.5	0.5-2.5	---	---	None	---	None
			Jun-Nov	---	---	---	---	None	---	None
			Dec	0.0-1.5	0.5-2.5	---	---	None	---	None
GrB:										
Grapeland	A	Negligible	Jan-Dec	---	---	---	---	None	---	None

Table 30.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
GtA:										
Guyton	C/D	Low	Jan-May	0.0-1.5	0.5-2.5	---	---	None	---	None
			Jun-Nov	---	---	---	---	None	---	None
			Dec	0.0-1.5	0.5-2.5	---	---	None	---	None
GuA:										
Guyton	C/D	Low	Jan-May	0.0-1.5	0.5-2.5	---	---	None	---	None
			Jun-Nov	---	---	---	---	None	---	None
			Dec	0.0-1.5	0.5-2.5	---	---	None	---	None
Sawtown	B	Negligible	Jan-Mar	3.5-5.0	4.0-5.5	---	---	None	---	None
			Apr-Dec	---	---	---	---	None	---	None
HaA:										
Hainesville	A	Negligible	Jan-Apr	4.0-6.0	>6.0	---	---	None	---	None
			May-Nov	---	---	---	---	None	---	None
			Dec	4.0-6.0	>6.0	---	---	None	---	None
Hc:										
Hannahatchee	B	Negligible	Jan-Apr	---	---	---	---	None	---	---
			Mar-May	---	---	---	---	None	Brief	Occasional
			Jun-Dec	---	---	---	---	None	---	---
HeB:										
Herty	D	Medium	Jan-Apr	0.5-1.0	0.5-2.0	---	---	None	---	None
			May-Dec	---	---	---	---	None	---	None
Ia:										
Iulus	C	Negligible	Jan-Apr	1.5-4.0	2.0-5.0	---	---	None	Very brief	Occasional
			May-Nov	---	---	---	---	None	---	---
			Dec	1.5-4.0	2.0-5.0	---	---	None	Very brief	Occasional
Iu:										
Iulus	C	Negligible	Jan-Apr	1.5-4.0	2.0-5.0	---	---	None	Very brief	Frequent
			May-Nov	---	---	---	---	None	---	---
			Dec	1.5-4.0	2.0-5.0	---	---	None	Very brief	Frequent
KhB:										
Kirvin	C	Low	Jan-Dec	---	---	---	---	None	---	None

Table 30.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
KiC:										
Kirvin	C	Low	Jan-Dec	---	---	---	---	None	---	None
KiD:										
Kirvin	C	Medium	Jan-Dec	---	---	---	---	None	---	None
KkD:										
Kisatchie	D	Very high	Jan-Dec	---	---	---	---	None	---	None
KuB:										
Kurth	B	Low	Jan-Dec	---	---	---	---	None	---	None
KwA:										
Kawah	A	Negligible	Jan-Dec	1.5-3.0	>6.0	---	---	None	---	None
La:										
Laneville	C	Negligible	Jan-May	1.5-3.0	2.5-4.0	---	---	None	Brief	Occasional
			Jun-Oct	---	---	---	---	None	---	---
			Nov-Dec	1.5-3.0	2.5-4.0	---	---	None	Brief	Occasional
LaB:										
LaCerda	D	Medium	Jan-Dec	---	---	---	---	None	---	None
LaE:										
LaCerda	D	Very high	Jan-Feb	---	---	---	---	None	---	None
Lb:										
Laneville	C	Negligible	Jan-May	1.5-3.0	2.5-4.0	---	---	None	Brief	Frequent
			Jun-Oct	---	---	---	---	None	---	---
			Nov-Dec	1.5-3.0	2.5-4.0	---	---	None	Brief	Frequent
LdB:										
Latex	B	Medium	Jan-Apr	3.0-4.5	3.5-5.0	---	---	None	---	None
			May-Nov	---	---	---	---	None	---	None
			Dec	3.0-4.5	3.5-5.0	---	---	None	---	None
LiB:										
Letney	A	Very low	Jan-Feb	---	---	---	---	None	---	None
LiC:										
Lilbert	B	Low	Jan-Feb	---	---	---	---	None	---	None

Table 30.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
LiD:										
Letney	A	Low	Jan-Feb	---	---	---	---	None	---	None
LnB:										
Lovelady	A	Low	Jan-Apr	2.0-4.0	2.5-4.5	---	---	None	---	None
			May-Nov	---	---	---	---	None	---	None
			Dec	2.0-4.0	2.5-4.5	---	---	None	---	None
LnD:										
Lovelady	A	Medium	Jan-Apr	2.0-4.0	2.5-4.5	---	---	None	---	None
			May-Nov	---	---	---	---	None	---	None
			Dec	2.0-4.0	2.5-4.5	---	---	None	---	None
MaE:										
Maben	C	Medium	Jan-Dec	---	---	---	---	None	---	None
MaG:										
Maben	C	High	Jan-Dec	---	---	---	---	None	---	None
Mf:										
Mattex	C/D	Low	Jan-Mar	1.0-2.5	1.5-4.0	---	---	None	Long	Frequent
			Apr-Nov	---	---	---	---	None	---	---
			Dec	1.0-2.5	1.5-4.0	---	---	None	Long	Frequent
MhC:										
Meth	C	Low	Jan-Dec	---	---	---	---	None	---	None
Mi:										
Mattex	C/D	Negligible	Jan-Mar	1.0-2.5	1.5-4.0	---	---	None	Long	Frequent
			Apr-Nov	---	---	---	---	None	---	---
			Dec	1.0-2.5	1.5-4.0	---	---	None	Long	Frequent
Iulus	C	Negligible	Jan-Apr	1.5-4.0	2.0-5.0	---	---	None	Very brief	Occasional
			Jun-Nov	---	---	---	---	None	---	---
			Dec	1.5-4.0	2.0-5.0	---	---	None	Very brief	Occasional
MiQ:										
Pits, mine or quarry, gravelly	---	---	Jan-Dec	---	---	---	---	None	---	None

Table 30.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
MiS:										
Metcalf	C	Medium	Jan-Apr	1.5-2.5	2.0-3.5	---	---	None	---	None
			May-Nov	---	---	---	---	None	---	None
			Dec	1.5-2.5	2.0-3.5	---	---	None	---	None
Sawtown	B	Low	Jan-Mar	3.0-4.5	3.3-5.0	---	---	None	---	None
			Apr-Dec	---	---	---	---	None	---	None
MpA:										
Mollville	C/D	Low	Jan-Jun	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
			Jul-Oct	---	---	---	---	---	---	None
			Nov-Dec	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
Besner	B	Very low	Jan-Feb	4.0-6.0	>6.0	---	---	None	---	None
			Mar-Dec	---	---	---	---	None	---	None
MsB:										
Moswell	D	Medium	Jan-Dec	---	---	---	---	None	---	None
MsD:										
Moswell	D	Very high	Jan-Dec	---	---	---	---	None	---	None
NaB:										
Naclina	D	Medium	Jan-Dec	---	---	---	---	None	---	None
NaD:										
Naclina	D	Very high	Jan-Dec	---	---	---	---	None	---	None
NeB:										
Nacogdoches	C	Medium	Jan-Dec	---	---	---	---	None	---	None
NeE:										
Nacogdoches	C	Low	Jan-Dec	---	---	---	---	None	---	None
Ow:										
Owentown	C	Negligible	Jan-June	2.5-4.0	>6.0	---	---	None	Brief	Occasional
			Jul-Aug	---	---		-	None	---	---
			Oct-Dec	2.5-4.0	>6.0	---	---	None	---	---

Table 30.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
PeC:										
Penning-------------------	C	Low	Jan-Apr	1.5-4.0	2.5-5.0	---	---	None	---	None
			May-Dec	---	---	---	---	None	---	None
Kurth---------------------	B	Medium	Jan-Dec	---	---	---	---	None	---	None
PoA:										
Pophers-------------------	C/D	Negligible	Jan-May	1.0-2.0	>6.0	---	---	None	Long	Frequent
			Jun-Nov	---	---	---	---	None	Long	Frequent
			Dec	1.0-2.0	>6.0	---	---	None	---	---
RaD:										
Rayburn-------------------	D	Very high	Jan-Feb	2.5-4.5	3.5-5.0	---	---	None	---	None
			Mar-Nov	---	---	---	---	None	---	None
			Dec	2.5-4.5	3.5-5.0	---	---	None	---	None
RkB:										
Raylake-------------------	D	Medium	Jan-Dec	---	---	---	---	None	---	None
RkD:										
Raylake-------------------	D	Very high	Jan-Dec	---	---	---	---	None	---	None
RnB:										
Rentzel-------------------	A	Very low	Jan-Mar	1.5-3.0	2.0-3.5	---	---	None	---	None
			Apr-Dec	---	---	---	---	None	---	None
RsB:										
Rosenwall-----------------	D	Medium	Jan-Dec	---	---	---	---	None	---	None
RsD:										
Rosenwall-----------------	D	Very high	Jan-Dec	---	---	---	---	None	---	None
SaB:										
Sacul---------------------	C	Medium	Jan-Apr	2.0-4.0	2.5-4.5	---	---	None	---	None
			May-Nov	---	---	---	---	None	---	None
			Dec	2.0-4.0	2.5-4.5	---	---	None	---	None
SeB:										
Sawlit--------------------	C	Medium	Jan-May	2.0-3.5	2.5-4.0	---	---	None	---	None
			Jun-Dec	---	---	---	---	None	---	None

Table 30.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
SfA:										
Sawtown	B	Low	Jan-Mar	3.5-5.0	4.0-5.5	---	---	None	---	None
			Apr-Dec	---	---	---	---	None	---	None
SmB:										
Smithdale	B	Low	Jan-Dec	---	---	---	---	None	---	None
TeD:										
Tehran	A	Low	Jan-Dec	---	---	---	---	None	---	None
TnB:										
Tenaha	B	Low	Jan-Dec	---	---	---	---	None	---	None
TnD:										
Tenaha	B	Medium	Jan-Dec	---	---	---	---	None	---	None
TnG:										
Tenaha	B	High	Jan-Dec	---	---	---	---	None	---	None
TsB:										
Tonkawa	A	Very low	Jan-Dec	---	---	---	---	None	---	None
TsD:										
Tonkawa	A	Low	Jan-Dec	---	---	---	---	None	---	None
Tu:										
Tuscosso	C	Negligible	Jan-Jun	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
			Jul-Dec	---	---	---	---	None	---	---
TuD:										
Trawick	C	Medium	Jan-Dec	---	---	---	---	None	---	None
TuG:										
Trawick	C	High	Jan-Dec	---	---	---	---	None	---	None
WeB:										
Woden	A	Very low	Jan-Dec	---	---	---	---	None	---	None
W:										
Water	---	---	Jan-Dec	---	---	---	---	---	---	---

Table 31.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
AaB:						
Alazan	---	---	---	---	High	Moderate
AbA:						
Alazan	---	---	---	---	High	Moderate
Besner	---	---	---	---	Low	Moderate
AtA:						
Alto	Densic material	50-70	---	Noncemented	High	Moderate
AtB:						
Attoyac	---	---	---	---	Moderate	Moderate
AuD:						
Austonio	---	---	---	---	Moderate	Moderate
BaB:						
Bernaldo	---	---	---	---	Moderate	Moderate
BeA:						
Besner	---	---	---	---	Low	Moderate
BfA:						
Betis	---	---	---	---	Low	Moderate
BoC:						
Bowie	---	---	---	---	Moderate	High
BuB:						
Bub	Paralithic bedrock	12-20	---	Weakly cemented	High	Moderate
ChA:						
Chireno	---	---	---	---	High	Low
CoB:						
Corrigan	Paralithic bedrock	20-40	---	Weakly cemented	High	High
CrG:						
Cuthbert	Densic material	20-40	---	Noncemented	High	High
CtE:						
Cuthbert	Densic material	20-40	---	Noncemented	High	High
CtG:						
Cuthbert	Densic material	20-40	---	Noncemented	High	High
CtS:						
Cuthbert	Densic material	20-40	---	Noncemented	High	High
CuE:						
Cuthbert	Densic material	20-40	---	Noncemented	High	High
DaC:						
Darco	---	---	---	---	Low	Moderate

Table 31.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
DaE:						
Darco	---	---	---	---	Low	Moderate
DsA:						
Dreka	---	---	---	---	High	Low
EeB:						
Eastwood	Densic material	40-60	---	Noncemented	High	High
EeD:						
Eastwood	Densic material	40-60	---	Noncemented	High	High
ElA:						
Eastwood	Densic material	40-60	---	Noncemented	High	High
Latex	---	---	---	---	Moderate	High
EtB:						
Etoile	Densic material	40-60	---	Noncemented	High	Moderate
EtD:						
Etoile	Densic material	40-60	---	Noncemented	High	Moderate
GaA:						
Gallime	---	---	---	---	Moderate	Moderate
Alazan	---	---	---	---	High	Moderate
GaB:						
Gallime	---	---	---	---	Moderate	Moderate
GaC:						
Gallime	---	---	---	---	Moderate	Moderate
Guyton	---	---	---	---	High	High
GrB:						
Grapeland	---	---	---	---	Low	Moderate
GtA:						
Guyton	---	---	---	---	High	High
GuA:						
Guyton	---	---	---	---	High	High
Sawtown	---	---	---	---	Moderate	Moderate
HaA:						
Hainesville	---	---	---	---	Low	High
Hc:						
Hannahatchee	---	---	---	---	Moderate	Moderate
HeB:						
Herty	Paralithic bedrock	40-60	---	Weakly cemented	High	High
Ia:						
Iulus	---	---	---	---	Moderate	High

Table 31.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
Iu:						
Iulus	---	---	---	---	Moderate	High
KhB:						
Kirvin	Densic material	40-60	---	Noncemented	High	High
KiC:						
Kirvin	Densic material	40-60	---	Noncemented	High	High
KiD:						
Kirvin	Densic material	40-60	---	Noncemented	High	High
KkD:						
Kisatchie	Paralithic bedrock	20-40	---	Weakly cemented	High	High
KuB:						
Kurth	Paralithic bedrock	60-80	---	Weakly cemented	High	Moderate
KwA:						
Kawah	---	---	---	---	Low	High
La:						
Laneville	---	---	---	---	High	High
LaB:						
LaCerda	Densic material	40-60	---	Noncemented	High	Moderate
LaE:						
LaCerda	Densic material	40-60	---	Noncemented	High	Moderate
Lb:						
Laneville	---	---	---	---	High	High
LdB:						
Latex	---	---	---	---	Moderate	High
LiB:						
Letney	---	---	---	---	Low	High
LiC:						
Lilbert	---	---	---	---	Moderate	High
LiD:						
Letney	---	---	---	---	Low	High
LnB:						
Lovelady	---	---	---	---	High	Moderate
LnD:						
Lovelady	---	---	---	---	High	Moderate
MaE:						
Maben	Densic material	20-40	---	Noncemented	High	Moderate
MaG:						
Maben	Densic material	20-40	---	Noncemented	High	Moderate
Mf:						
Mattex	---	---	---	---	High	High

Table 31.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
MhC:						
Meth	---	---	---	---	High	Moderate
Mi:						
Mattex	---	---	---	---	High	High
Iulus	---	---	---	---	Moderate	High
MiQ:						
Pits, mine or quarry, gravelly	---	---	---	---	Moderate	Low
MiS:						
Metcalf	---	---	---	---	High	Moderate
Sawtown	---	---	---	---	Moderate	Moderate
MpA:						
Mollville	---	---	---	---	High	High
Besner	---	---	---	---	Low	Moderate
MsB:						
Moswell	Densic material	40-60	---	Noncemented	High	High
MsD:						
Moswell	Densic material	40-60	---	Noncemented	High	High
NaB:						
Naclina	Densic material	40-60	---	Noncemented	High	Moderate
NaD:						
Naclina	Densic material	40-60	---	Noncemented	High	Moderate
NeB:						
Nacogdoches	---	---	---	---	High	High
NeE:						
Nacogdoches	---	---	---	---	High	High
Ow:						
Owentown	---	---	---	---	Moderate	Moderate
PeC:						
Penning	Densic bedrock	40-60	---	---	High	High
Kurth	---	---	---	---	High	Moderate
PoA:						
Pophers	---	---	---	---	High	High
RaD:						
Rayburn	Paralithic bedrock	40-60	---	Weakly cemented	High	High
RkB:						
Raylake	Densic material	40-60	---	Noncemented	High	High
RkD:						
Raylake	Densic material	40-60	---	Noncemented	High	High

Table 31.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
RnB: Rentzel	---	---	---	---	High	High
RsB: Rosenwall	Paralithic bedrock	20-40	---	Weakly cemented	High	High
RsD: Rosenwall	Paralithic bedrock	20-40	---	Weakly cemented	High	High
SaB: Sacul	Densic material	40-80	---	Noncemented	High	High
SeB: Sawlit	---	---	---	---	High	High
SfA: Sawtown	---	---	---	---	Moderate	Moderate
SmB: Smithdale	---	---	---	---	Moderate	Moderate
TeD: Tehran	---	---	---	---	Low	High
TnB: Tenaha	Densic material	40-60	---	Noncemented	Moderate	Moderate
TnD: Tenaha	Densic material	40-60	---	Noncemented	Moderate	Moderate
TnG: Tenaha	Densic material	40-60	---	Noncemented	Moderate	Moderate
TsB: Tonkawa	---	---	---	---	Low	Moderate
TsD: Tonkawa	---	---	---	---	Low	Moderate
Tu: Tuscosso	---	---	---	---	High	Moderate
TuD: Trawick	Paralithic bedrock	20-40	---	Weakly cemented	High	High
TuG: Trawick	Paralithic bedrock	20-40	---	Weakly cemented	High	High
WeB: Woden	---	---	---	---	Moderate	Moderate
W: Water	---	---	---	---	---	---

Table 32.--Physical Analyses of Selected Soils

(The abbreviation “COLE” means coefficient of linear extensibility. Dashes indicate that data were not available. Analyses performed at USDA NRCS, National Soil Survey Laboratory, Lincoln, Nebraska.)

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)	Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	COLE	Bulk Density: 1/3- bar	Oven Dry	Water Content: 1/3- bar	15-bar
	In		(Percent)										cm/cm	g/cc	g/cc	Pct	Pct
Etoile (1)																	
(S06-TX405-003)																	
07N00079	0-8	Ap	0.4	0.7	0.9	13.6	25.5	41.1	14.4	43.4	9.5	15.5	0.017	1.49	1.57	16.3	8.4
07N00080	8-24	Bt	0.1	0.2	0.3	2.8	10.5	13.9	16.6	27.7	43.8	58.4	0.128	1.28	1.84	33.4	22.2
07N00081	24-32	Btss	0.5	0.2	0.3	2.1	8.1	11.2	16.9	26.5	42.6	62.3	0.132	1.35	1.96	32.3	22.3
07N00082	32-51	Btkss	2.2	1.8	1.8	1.2	3.7	10.7	24.2	32.8	29.7	56.5	0.130	1.35	1.95	32.7	20.9
07N00083	51-65	Cd/Bt	0.6	0.9	2.7	12.6	9.8	26.6	19.4	24.8	13.7	48.6	0.112	1.25	1.72	36.3	24.4
07N00084	65-80	Cdk	---	0.4	2.6	12.3	9.8	25.1	18.7	23..7	12.4	51.2	---	---	---	---	25.0
Naclina (1)																	
(S06-TX405-002)																	
07N00073	0-6	Ap	1.6	2.2	6.4	8.4	18.6	37.2	10.6	41.5	16.5	21.3	0.027	1.41	1.53	17.3	11.1
07N00074	6-21	Bw	1.0	1.2	3.0	4.6	11.5	21.3	13.6	35.0	35.8	43.7	0.077	1.40	1.76	27.5	17.6
07N00075	21-32	Bss	0.9	0.4	2.0	3.5	8.6	15.4	15.5	30.6	40.2	54.0	0.114	1.37	2.00	29.6	21.9
07N00076	32-56	Bkss	1.6	0.8	1.4	3.4	8.6	15.8	21.9	32.8	27.7	51.4	0.123	1.40	2.00	27.4	20.7
07N00077	56-70	CB	0.9	1.0	1.0	1.9	5.4	10.2	25.7	34.0	28.3	55.8	0.130	1.38	1.99	29.2	22.0
07N00078	70-80	Cd	tr	0.1	6.2	11.2	6.4	23.9	17.6	26.7	21.1	49.4	0.062	1.41	1.70	28.9	24.0
Raylake (1)																	
(S06-TX405-004)																	
07N00085	0-6	Ap	0.2	0.3	1.4	12.1	22.3	36.3	16.1	26.8	23.1	36.9	0.050	1.39	1.61	22.3	16.4
07N00086	6-16	Bss1	0.1	0.1	0.4	5.6	15.9	22.1	13.7	19.3	37.4	58.6	0.137	1.19	1.75	37.0	21.6
07N00087	16-25	Bss2	0.1	0.2	0.8	14.7	19.2	35.0	16.3	26.7	22.0	38.3	0.059	1.45	1.72	23.3	11.0
07N00088	25-33	Bss3	0.1	0.2	1.1	10.1	23.5	35.0	16.3	25.8	22.7	39.2	0.060	1.37	1.70	26.6	15.5
07N00089	33-48	Bss4	---	0.1	0.2	1.0	2.5	3.8	15.9	16.1	29.4	80.1	0.168	1.13	1.81	42.8	26.8
07N00090	48-60	C/Bss	---	tr	tr	0.1	0.7	0.8	15.7	15.7	24.4	83.5	0.130	1.11	1.60	42.8	33.0
07N00091	60-80	Cd	---	tr	0.1	0.4	5.4	5.9	17.5	18.2	21.6	75.9	0.149	1.10	1.67	43.4	30.0
Tuscosso (1)																	
(S06-TX405-001)																	
07N00067	0-5	Ap	0.2	0.7	4.3	36.8	10.6	52.6	10.1	27.1	13.6	20.3	0.022	1.34	1.43	16.3	10.4
07N00068	5-11	Bw1	0.7	0.7	4.3	26.0	7.5	39.2	11.5	24.1	24.1	36.7	0.024	1.49	1.60	20.3	14.2
07N00069	11-25	Bw2	1.0	1.0	4.3	27.7	8.1	42.1	10.4	20.0	25.1	37.9	0.024	1.56	1.68	21.1	14.2
07N00070	25-40	Bw3	3.9	2.7	4.9	22.0	7.2	40.7	11.3	21.5	23.8	37.8	0.036	1.63	1.82	20.4	16.8
07N00071	40-64	Bw4	2.1	1.4	3.7	23.9	8.3	39.4	12.2	22.9	25.0	37.7	0.042	1.62	1.84	21.8	15.2
07N00072	64-80	Bw5	1.6	1.4	7.0	30.4	5.4	45.8	8.3	14.6	25.5	39.6	0.053	1.58	1.85	23.2	15.8

(1) Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

Table 33.--Chemical Analyses of Selected Soils

(Dashes indicate that analyses were not made. Analyses performed at USDA-NRCS, National Soil Survey Laboratory, Lincoln, Nebraska.)

Soil name and sample number	Depth	Horizon	pH 1:1 (soil: water)	Extractable bases				Cation Exchange capacity (pH 7) (NH_4OAc)	Base Satur- ation (NH_4OAc)	Aluminum Saturation	Exchange able Sodium	Carbonate as $CaCO_3$
				Ca	Mg	Na	K					
	In		pH	---------------- Meq/100gm ------------				Pct	Pct	Pct	Pct	Pct
Etoile (1)												
(S06-TX405-003)												
07N00079	0-8	Ap	6.3	9.1	2.3	---	0.1	11.8	97	---	---	---
07N00080	8-24	Bt	5.7	18.6	9.5	1.0	0.5	35.6	83	11	3	---
07N00081	24-32	Btss	6.9	26.2*	12.6	1.8	0.6	38.9	100	---	5	---
07N00082	32-51	Btkss	8.5	79.9*	14.5	2.4	0.4	31.8	100	---	8	16
07N00083	51-65	Cd/Bt	8.2	73.4*	21.1	4.7	0.5	42.2	100	---	11	12
07N00084	65-80	Cdk	8.0	76.6*	22.5	5.8	0.4	40.1	100	---	14	9
Naclina (1)												
(S06-TX405-002)												
07N00073	0-6	Ap	5.9	13.5	2.5	---	0.3	17.4	94	1	---	---
07N00074	6-21	Bw	5.8	18.7	4.6	---	0.4	26.3	90	4	---	---
07N00075	21-32	Bss	6.9	30.6*	6.0	---	0.7	35.1	100	---	---	1
07N00076	32-56	Bkss	8.1	70.3*	9.2	0.1	0.4	34.4	100	---	---	19
07N00077	56-70	CB	8.4	70.6*	10.6	0.6	0.4	34.7	100	---	---	28
07N00078	70-80	Cd	8.4	67.5*	12.4	1.3	0.7	33.1	100	---	---	17
Raylake (1)												
(S06-TX405-004)												
07N00085	0-6	Ap	5.0	5.0	5.8	0.1	0.8	23.9	33	36	tr	---
07N00086	6-16	Bss1	4.7	1.9	5.3	0.3	0.9	30.2	18	65	1	---
07N00087	16-25	Bss2	4.9	1.1	3.1	0.2	0.6	19.0	20	66	1	---
07N00088	25-33	Bss3	4.8	1.0	4.1	0.4	0.7	20.4	23	62	2	---
07N00089	33-48	Bss4	4.4	3.3	8.4	1.9	1.4	43.1	28	56	4	---
07N00090	48-60	C/Bss	4.2	3.9	8.9	1.7	1.5	44.9	29	54	4	---
07N00091	60-80	Cd	4.4	4.6	12.3	1.7	1.5	41.3	39	42	4	---
Tuscosso (1)												
(S06-TX405-001)												
07N00067	0-5	Ap	5.7	8.9	2.3	---	0.4	14.2	82	---	---	---
07N00068	5-11	Bw1	6.2	9.7	3.5	---	0.3	15.9	85	---	---	---
07N00069	11-25	Bw2	6.0	8.3	4.1	---	0.3	15.7	81	1	---	---
07N00070	25-40	Bw3	6.7	11.4*	7.2	---	0.4	18.5	100	---	---	---
07N00071	40-64	Bw4	6.7	10.8*	6.5	---	0.4	17.1	100	---	---	---
07N00072	64-80	Bw5	6.8	11.2*	6.9	---	0.4	18.1	100	---	---	---

(1) Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

Table 34.--Clay Mineralogy Analyses of Selected Soils

(Analysis by National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska. Relatvie Peak Size; 5-Very large; 4-Large; 3-Medium; 2-Small; 1-Very small. Dashes indicate that none of the mineral was detected)

Soil name and sample number	Depth	Horizon	Peak Size								
			Montmor-illonite	Montmor-illonite-Mica	Mica	Kaolinite	Quartz	Goethite	Vermiculite	Calcite	Hematite
	In										
Etoile (1)											
(S06-TX405-003)											
07N00079	0-8	Ap	---	---	---	3	1	---	3	---	---
07N00081	24-32	Btss	---	2	1	3	1	1	3	---	---
07N00083	51-65	Cd/Bt	---	3	---	3	---	1	---	---	---
Naclina (1)											
(S06-TX405-002)											
07N00073	0-6	Ap	---	3	---	3	1	1	---	---	---
07N00075	21-32	Bss	---	3	---	3	1	---	1	2	
07N00077	56-70	CB	1	---	1	3	---	1	---	---	1
Raylake (1)											
(S06-TX405-004)											
07N00085	0-6	Ap	---	3	1	3	---	1	---	---	---
07N00087	16-25	Bss2	---	3	1	3	1	---	---	---	---
07N00089	33-48	Bss4	---	3	1	3	1	---	---	---	---
07N00091	60-80	Cd	---	3	1	3	1	---	---	---	---
Tuscosso (1)											
(S06-TX405-001)											
07N00067	0-5	Ap	---	---	1	2	---	1	---	---	1
07N00069	11-25	Bw2	---	---	1	2	---	1	---	---	1
07N00071	40-64	Bw4	3	---	---	3	---	1	---	---	---

(1) Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

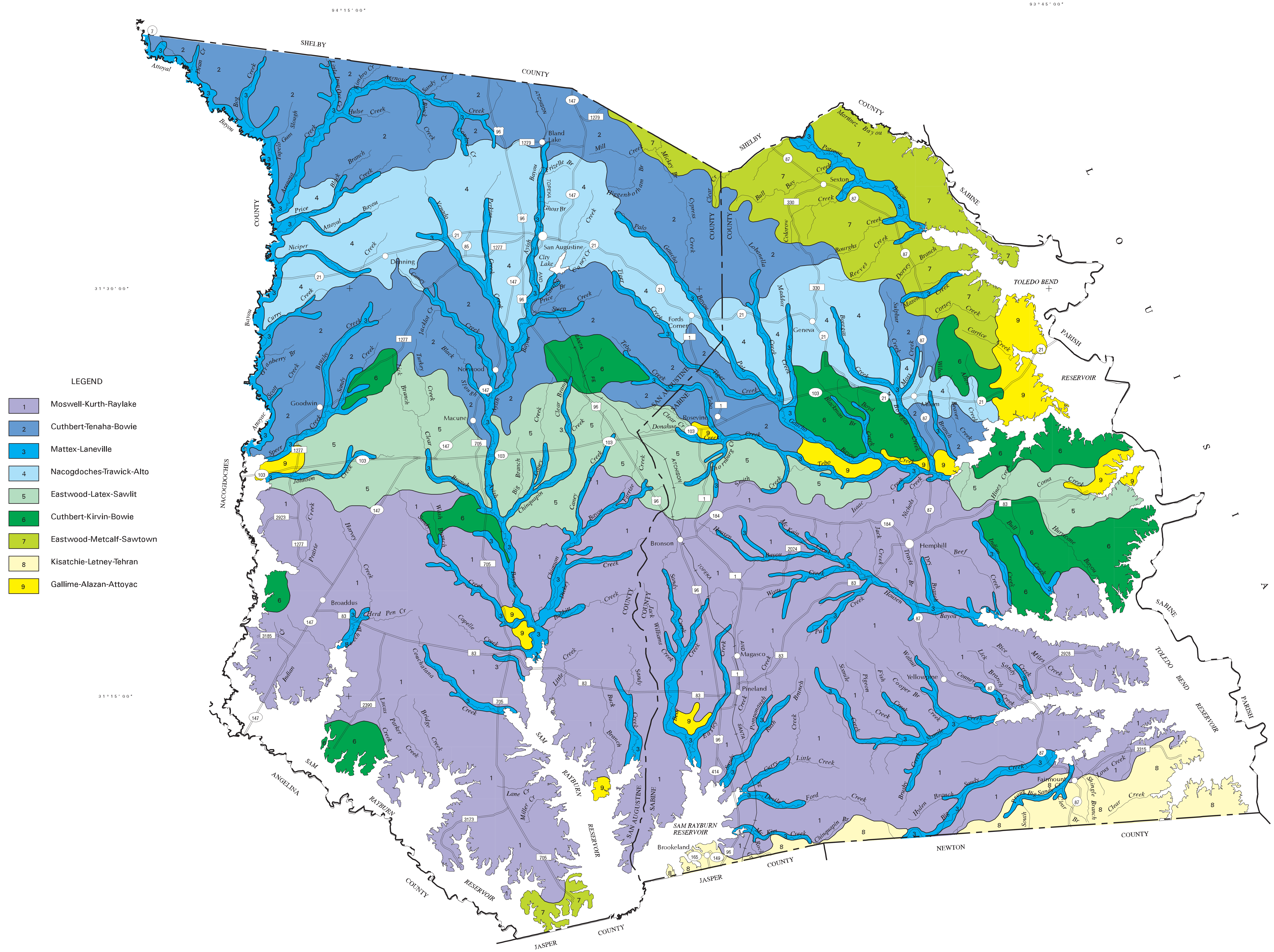
Table 35.--Taxonomic Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Alazan	Fine-loamy, siliceous, semiactive, thermic Aquic Glossudalfs
Alto	Fine-loamy, siliceous, active, thermic Typic Hapludalfs
Attoyac	Fine-loamy, siliceous, semiactive, thermic Typic Paleudalfs
Austonio	Fine-loamy, siliceous, active, thermic Typic Hapludalfs
Bernaldo	Fine-loamy, siliceous, semiactive, thermic Glossic Paleudalfs
Besner	Coarse-loamy, siliceous, semiactive, thermic Typic Glossudalfs
Betis	Sandy, siliceous, thermic Lamellic Paleudults
Bowie	Fine-loamy, siliceous, semiactive, thermic Plinthic Paleudults
Bub	Clayey, mixed, active, thermic, shallow Typic Hapludalfs
Chireno	Fine, mixed, superactive, thermic Pachic Argiudolls
Corrigan	Fine, smectitic, thermic Albaquic Hapludalfs
Cuthbert	Fine, mixed, semiactive, thermic Typic Hapludults
Darco	Loamy, siliceous, semiactive, thermic Grossarenic Paleudults
Dreka	Fine-silty, siliceous, active, nonacid, thermic Aeric Fluvaquents
Eastwood	Fine, smectitic, thermic Chromic Vertic Hapludalfs
Etoile	Fine, smectitic, thermic Vertic Hapludalfs
Gallime	Fine-loamy, siliceous, semiactive, thermic Glossic Paleudalfs
Grapeland	Siliceous, thermic Psammentic Paleudults
Guyton	Fine-silty, siliceous, active, thermic Typic Glossaqualfs
Hainesville	Thermic, coated Lamellic Quartzipsamments
Hannahatchee	Fine-loamy, siliceous, active, thermic Dystric Fluventic Eutrochrepts
Herty	Fine, smectitic, thermic Oxyaquic Vertic Hapludalfs
Iulus	Coarse-loamy, siliceous, active, thermic Fluvaquentic Dystrochrepts
Kawah	Thermic, coated Aquic Quartzipsamments
Kirvin	Fine, mixed, semiactive, thermic Typic Hapludults
Kisatchie	Fine, smectitic, thermic Typic Hapludalfs
Kurth	Fine-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs
LaCerda	Very-fine, smectitic, thermic Chromic Dystruderts
Laneville	Fine-silty, siliceous, active, thermic Fluvaquentic Eutrochrepts
Latex	Fine-loamy, siliceous, semiactive, thermic Glossic Paleudalfs
Letney	Loamy, siliceous, semiactive, thermic Arenic Paleudults
Lilbert	Loamy, siliceous, semiactive, thermic Arenic Plinthic Paleudults
Lovelady	Loamy, mixed, semiactive, thermic Arenic Glossudalfs
Maben	Fine, mixed, active, thermic Ultic Hapludalfs
Mattex	Fine-loamy, siliceous, active, acid, thermic Aeric Fluvaquents
Metcalf	Fine-silty, siliceous, semiactive, thermic Aquic Glossudalfs
Meth	Fine, mixed, semiactive, thermic Ultic Hapludalfs
Mollville	Fine-loamy, siliceous, active, thermic Typic Glossaqualfs
Moswell	Very-fine, smectitic, thermic Vertic Hapludalfs
Naclina	Fine, smectitic, thermic Chromic Hapluderts
Nacogdoches	Fine, kaolinitic, thermic Rhodic Paleudalfs
Owentown	Coarse-loamy, siliceous, active, thermic Fluventic Dystrochrepts
Penning	Fine-loamy, siliceous, active, thermic Aquic Glossudalfs
Pophers	Fine-silty, siliceous, active, acid, thermic Aeric Fluvaquents
Rayburn	Fine, smectitic, thermic Vertic Hapludalfs
Raylake	Fine, smectitic, thermic Chromic Dystruderts
Rentzel	Loamy, siliceous, semiactive, thermic Arenic Plinthaquic Paleudults
Rosenwall	Very-fine, mixed, thermic Aquic Hapludults
Sacul	Fine, mixed, active, thermic Aquic Hapludults
Sawlit	Fine-loamy, siliceous, active, thermic Aquic Glossudalfs
Sawtown	Fine-loamy, siliceous, active, thermic Typic Glossudalfs
Smithdale	Fine-loamy, siliceous, subactive, thermic Typic Paleudults
Tehran	Loamy, siliceous, semiactive, thermic Grossarenic Paleudults
Tenaha	Loamy, siliceous, semiactive, thermic Arenic Hapludults
Tonkawa	Thermic, coated Typic Quartzipsamments
Trawick	Fine, mixed, active, thermic Mollic Hapludalfs
Tuscosso	Fine, mixed, active, thermic Dystric Fluventic Eutrochrepts
Woden	Coarse-loamy, siliceous, semiactive, thermic Typic Paleudalfs

NRCS Accessibility Statement

The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.



UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TEXAS AGRILIFE RESEARCH

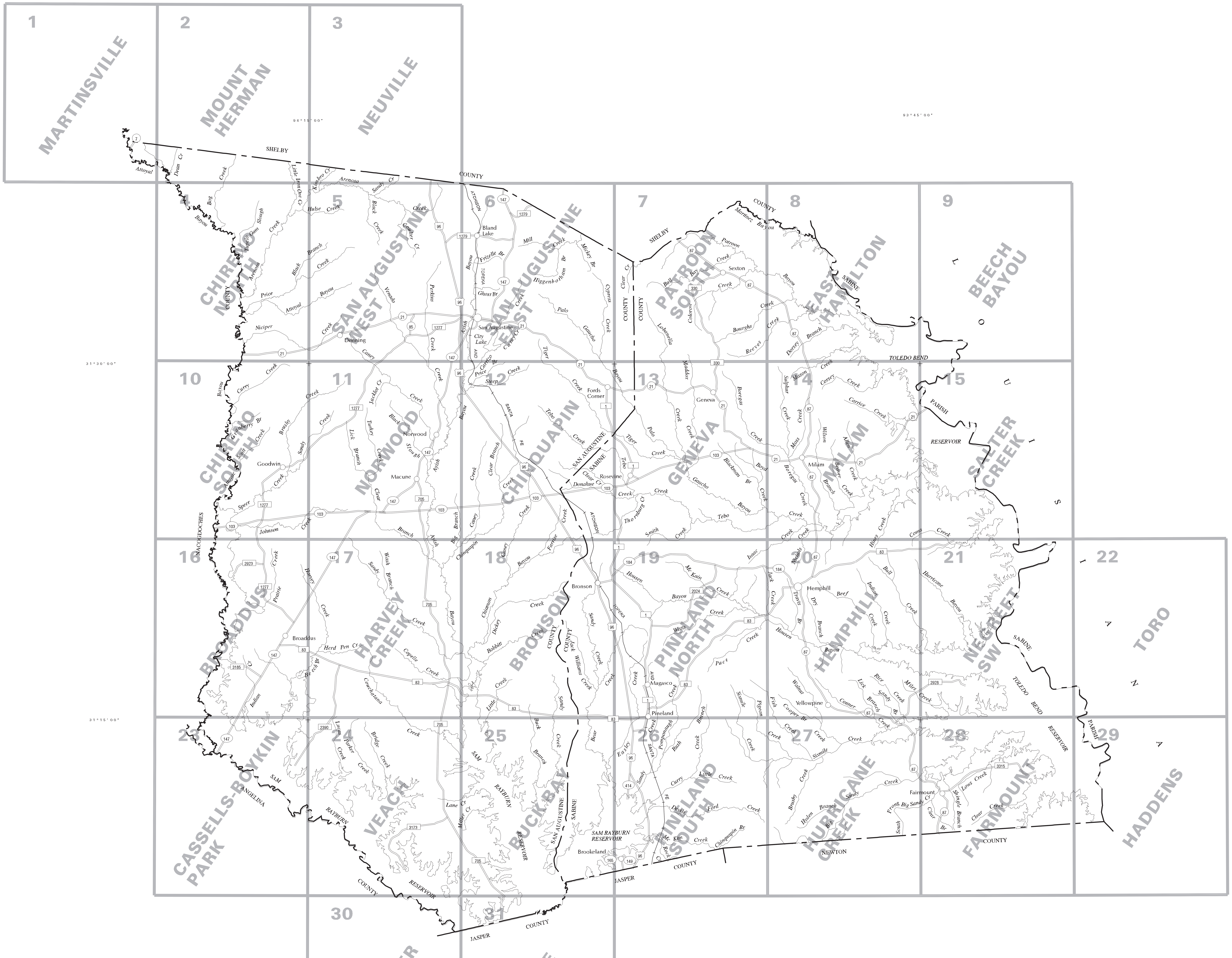
GENERAL SOIL MAP
SAN AUGUSTINE AND SABINE COUNTIES, TEXAS

MILES

KILOMETERS

SCALE = 1:160000

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS
SAN AUGUSTINE AND SABINE COUNTIES,
TEXAS

N

MILES

KILOMETERS

SCALE = 1:160000

SOIL LEGEND

SYMBOL	NAME
AaB	Alazan fine sandy loam, 0 to 2 percent slopes
AbA	Alazan-Besner complex, 0 to 2 percent slopes
AtA	Alto clay loam, 1 to 3 percent slopes
AtB	Attoyac fine sandy loam, 0 to 4 percent slopes
AuD	Austonio fine sandy loam, 5 to 12 percent slopes
BaB	Bernaldo fine sandy loam, 0 to 3 percent slopes
BeA	Besner fine sandy loam, 0 to 3 percent slopes
BfA	Betis loamy fine sand, 0 to 8 percent slopes
BoC	Bowie fine sandy loam, 1 to 5 percent slopes
BuB	Bub clay loam, 2 to 5 percent slopes
ChA	Chireno clay loam, 0 to 2 percent slopes
CoB	Corrigan fine sandy loam, 1 to 5 percent slopes
CrG	Cuthbert soils, 5 to 15 percent slopes, graded
CtE	Cuthbert fine sandy loam, 5 to 15 percent slopes
CtG	Cuthbert fine sandy loam, 15 to 35 percent slopes
CtS	Cuthbert gravelly fine sandy loam, 15 to 35 percent slopes, stony
CuE	Cuthbert gravelly fine sandy loam, 5 to 15 percent slopes
DaC	Darco loamy fine sand, 1 to 8 percent slopes
DaE	Darco loamy fine sand, 8 to 15 percent slopes
DsA	Dreka loam, frequently flooded
EeB	Eastwood very fine sandy loam, 1 to 5 percent slopes
EeD	Eastwood very fine sandy loam, 5 to 15 percent slopes
ElA	Eastwood-Latex complex, 1 to 3 percent slopes, mounded
EtB	Etoile loam, 1 to 5 percent slopes
EtD	Etoile fine sandy loam, 5 to 15 percent slopes
GaA	Gallime-Alazan complex, 0 to 2 percent slopes
GaB	Gallime very fine sandy loam, 1 to 3 percent slopes
GaC	Gallime-Guyton complex, 0 to 2 percent slopes
GrB	Grapeland loamy fine sand, 1 to 5 percent slopes
GtA	Guyton silt loam, 0 to 1 percent slopes
GuA	Guyton-Sawtown complex, mounded
HaA	Hainesville loamy fine sand, 0 to 2 percent slopes
Hc	Hannahatchee loam, 0 to 1 percent slopes, occasionally flooded
HeB	Herty loam, 0 to 3 percent slopes
Ia	Iulus fine sandy loam, 0 to 1 percent slopes, occasionally flooded
Iu	Iulus fine sandy loam, 0 to 1 percent slopes, frequently flooded
KhB	Kirvin fine sandy loam, 1 to 5 percent slopes
KiC	Kirvin gravelly fine sandy loam, 1 to 5 percent slopes
KiD	Kirvin soils, 2 to 8 percent slopes, graded
KkD	Kisatchie loam, 5 to 15 percent slopes
KuB	Kurth fine sandy loam, 1 to 3 percent slopes
KwA	Kawah fine sand, 0 to 2 percent slopes
La	Laneville loam, 0 to 1 percent slopes, occasionally flooded
LaB	LaCerda clay loam, 0 to 5 percent slopes
LaE	LaCerda clay loam, 5 to 15 percent slopes
Lb	Laneville loam, 0 to 1 percent slopes, frequently flooded
LdB	Latex fine sandy loam, 1 to 3 percent slopes
LiB	Letney loamy sand, 1 to 5 percent slopes
LiC	Lilbert loamy fine sand, 1 to 5 percent slopes
LiD	Letney loamy sand, 5 to 15 percent slopes
LnB	Lovelady loamy fine sand, 1 to 5 percent slopes
LnD	Lovelady loamy fine sand, 5 to 8 percent slopes
MaE	Maben fine sandy loam, 5 to 15 percent slopes
MaG	Maben fine sandy loam, 15 to 35 percent slopes
Mf	Mattex clay loam, 0 to 1 percent slopes, frequently flooded
MhC	Meth fine sandy loam, 1 to 5 percent slopes
Mi	Mattex-Iulus complex, 0 to 1 percent slopes, frequently flooded
MiQ	Mine or Quarry
MiS	Metcalf-Sawtown complex, 0 to 2 percent slopes
MpA	Mollville-Besner complex, 0 to 1 percent slopes, mounded
MsB	Moswell loam, 1 to 5 percent slopes
MsD	Moswell loam, 5 to 15 percent slopes
NaB	Naclina clay loam, 1 to 5 percent slopes
NaD	Naclina clay, 5 to 15 percent slopes
NeB	Nacogdoches fine sandy loam, 1 to 5 percent slopes
NeE	Nacogdoches clay loam, 1 to 5 percent slopes
Ow	Owentown fine sandy loam, occasionally flooded
PeC	Penning-Kurth complex, 0 to 2 percent slopes
PoA	Pophers silt loam, 0 to 1 percent slopes, frequently flooded
RaD	Rayburn loam, 5 to 15 percent slopes
RkB	Raylake clay, 1 to 5 percent slopes
RkD	Raylake clay loam, 5 to 15 percent slopes
RnB	Rentzel loamy fine sand, 0 to 5 percent slopes
RsB	Rosenwall fine sandy loam, 1 to 5 percent slopes
RsD	Rosenwall fine sandy loam, 5 to 15 percent slopes
SaB	Sacul fine sandy loam, 1 to 5 percent slopes
SeB	Sawlit fine sandy loam, 0 to 3 percent slopes
SfA	Sawtown very fine sandy loam, 0 to 2 percent slopes
SmB	Smithdale sandy loam, 1 to 5 percent slopes
TeD	Tehran loamy sand 5 to 15 percent slopes
TnB	Tenaha loamy fine sand, 1 to 5 percent slopes
TnD	Tenaha loamy fine sand, 5 to 15 percent slopes
TnG	Tenaha loamy fine sand, 15 to 35 percent slopes
TsB	Tonkawa fine sand, 0 to 8 percent slopes
TsD	Tonkawa fine sand, 8 to 15 percent slopes
Tu	Tuscosso loam, 0 to 1 percent slopes, frequently flooded
TuD	Trawick gravelly clay loam, 5 to 15 percent slopes
TuG	Trawick clay loam, 15 to 35 percent slopes
W	Water
WeB	Woden fine sandy loam, 0 to 4 percent slopes

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES
- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park)
- Land grant
- Limit of soil survey (label) and/or denied access area
- Field sheet matchline & neatline
- Previously Published Survey

OTHER BOUNDARY (label)
- Airport, airfield
- Cemetery
- City/county park

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER
(section and land grants)

GEOGRAPHIC COORDINATE TICK

TRANSPORTATION
- Divided roads
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS
- Interstate — 173, 79 345
- Federal — 287, 410 224
- State — 52, 52 347
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES
- Without road
- With road
- With railroad
- Single side slope (showing actual feature location)

DAMS
- Medium or Small — W

LANDFORM FEATURES
- Prominent hill or peak
- Soil Sample Site — S

MISCELLANEOUS CULTURAL FEATURES
- Farmstead, house (omit in urban areas)
- Church
- School
- Other Religion (label) — Mt Carmel
- Located object (label) — Ranger Station
- Tank (label) — Petroleum
- Lookout Tower
- Oil and/or Natural Gas Wells
- Windmill
- Lighthouse

HYDROGRAPHIC FEATURES

STREAMS
- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end

DRAINAGE AND IRRIGATION
- Double-line canal (label) — CANAL
- Perennial drainage and/or irrigation ditch
- Intermittent drainage and/ or irrigation ditch

SMALL LAKES, PONDS AND RESERVOIRS
- Perennial water
- Miscellaneous water
- Flood pool line — FLOOD POOL LINE

MISCELLANEOUS WATER FEATURES
- Spring
- Well, artesian
- Well, irrigation

SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS — AaB WeB

LANDFORM FEATURES

ESCARPMENTS
- Bedrock
- Other than bedrock
- Short steep slope
- Gully
- Depression, closed
- Sinkhole

EXCAVATIONS

PITS
- Borrow pits
- Gravel pit
- Mine or quarry
- Landfill

MISCELLANEOUS SURFACE FEATURES
- Blowout
- Clay spot
- Gravelly spot
- Lava flow
- Marsh or swamp
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip
- Sodic spot
- Spoil area
- Stony spot
- Very stony spot
- Wet spot

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
MARTINSVILLE QUADRANGLE
SHEET NUMBER 1 OF 31

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

2 MOUNT HERMAN

4 CHIRENO NORTH

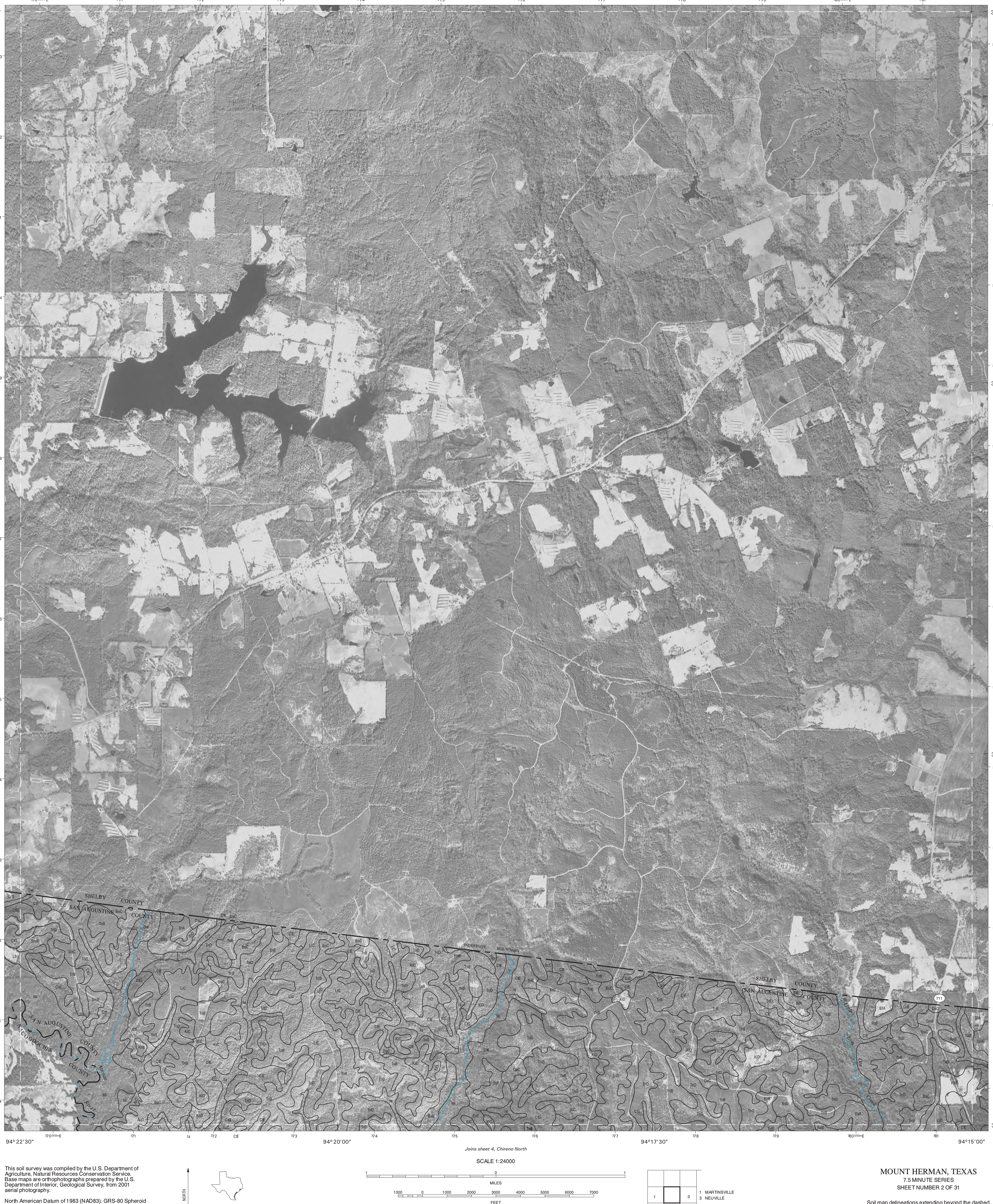
INDEX TO ADJOINING 7.5 MAPS

MARTINSVILLE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
MOUNT HERMAN QUADRANGLE
SHEET NUMBER 2 OF 31



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

1 MARTINSVILLE
3 NEUVILLE
4 CHIRENO NORTH
5 SAN AUGUSTINE WEST

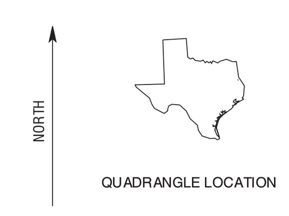
INDEX TO ADJOINING 7.5 MAPS

MOUNT HERMAN, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

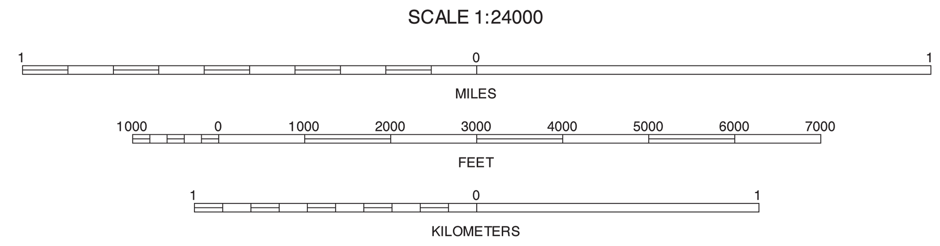
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

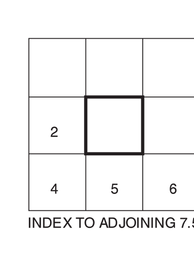
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

SCALE 1:24000





INDEX TO ADJOINING 7.5 MAPS

NEUVILLE, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 3 OF 31

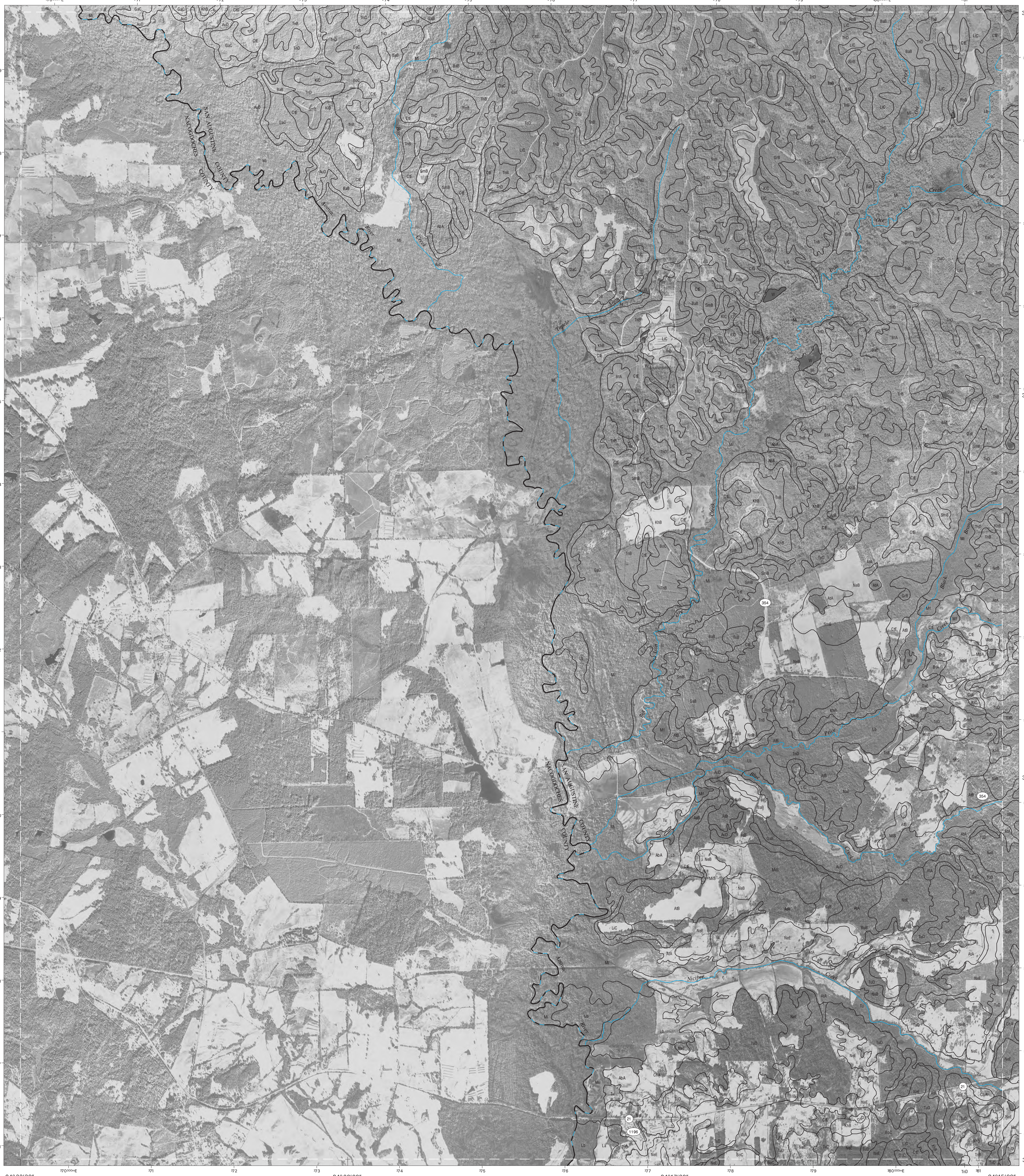
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 1, Martinsville

Joins sheet 2, Mount Herman

Joins sheet 3, Neuville



Joins sheet 5, San Augustine West

Joins sheet 10, Chireno South

Joins sheet 11, Norwood

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

1	2	3
		5
	10	11

1 MARTINSVILLE
2 MOUNT HERMAN
3 NEUVILLE
5 SAN AUGUSTINE WEST
10 CHIRENO SOUTH
11 NORWOOD

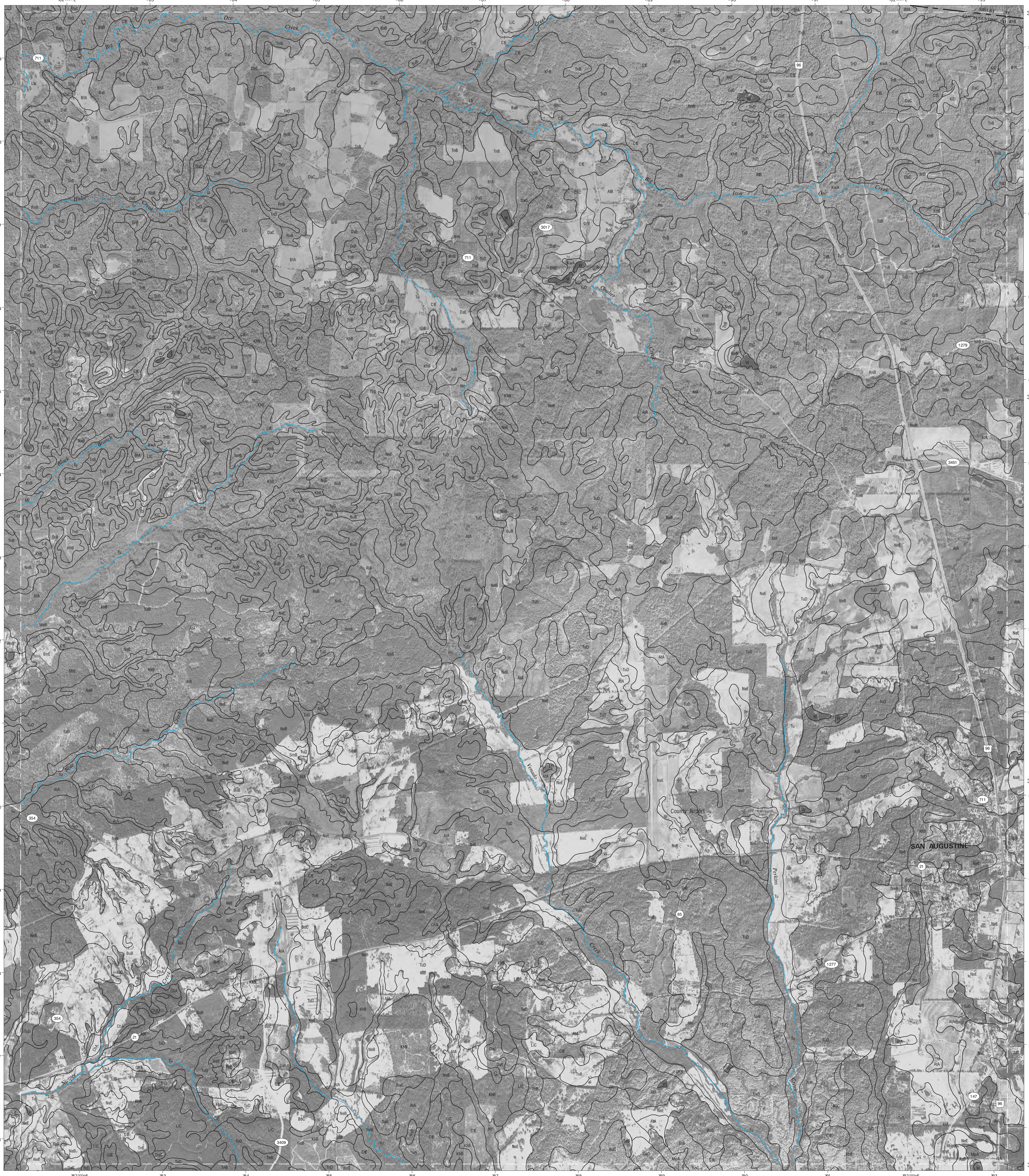
INDEX TO ADJOINING 7.5 MAPS

CHIRENO NORTH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

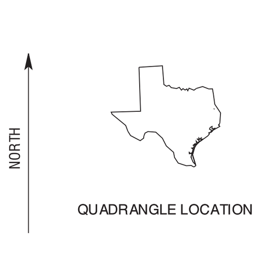
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
SAN AUGUSTINE WEST QUADRANGLE
SHEET NUMBER 5 OF 31



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

2	3	
4		6
10	11	12

2 MOUNT HERMAN
3 NEUVILLE
4 CHIRENO NORTH
6 SAN AUGUSTINE EAST
10 CHIRENO SOUTH
11 NORWOOD
12 CHINQUAPIN

INDEX TO ADJOINING 7.5 MAPS

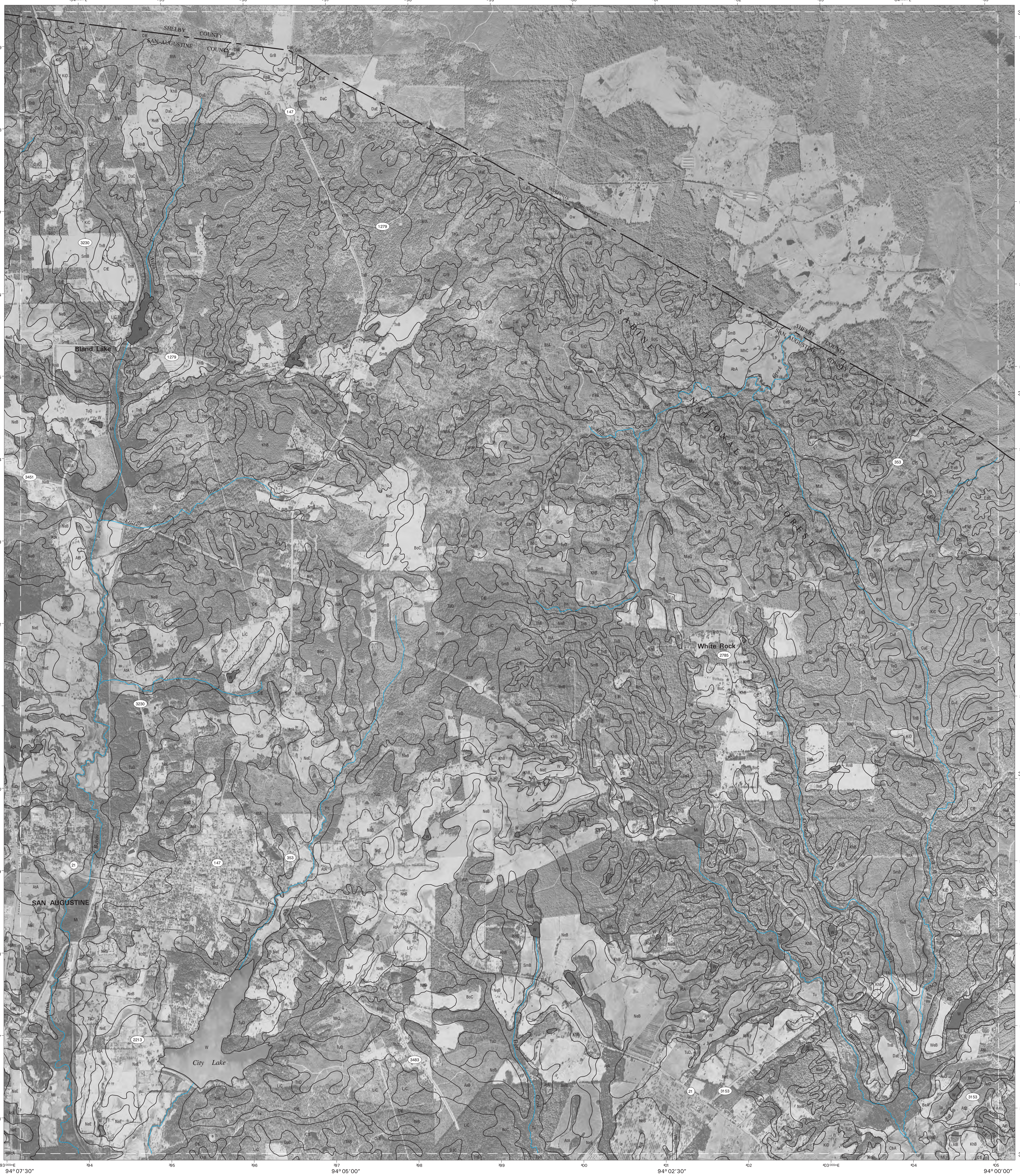
SAN AUGUSTINE WEST, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
SAN AUGUSTINE EAST QUADRANGLE
SHEET NUMBER 6 OF 31

Joins sheet 3, Neuville



Joins sheet 5, San Augustine West

Joins sheet 7, Patroon South

Joins sheet 11, Norwood

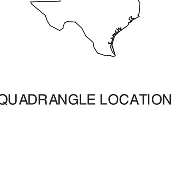
Joins sheet 12, Chinquapin

Joins sheet 13, Geneva

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

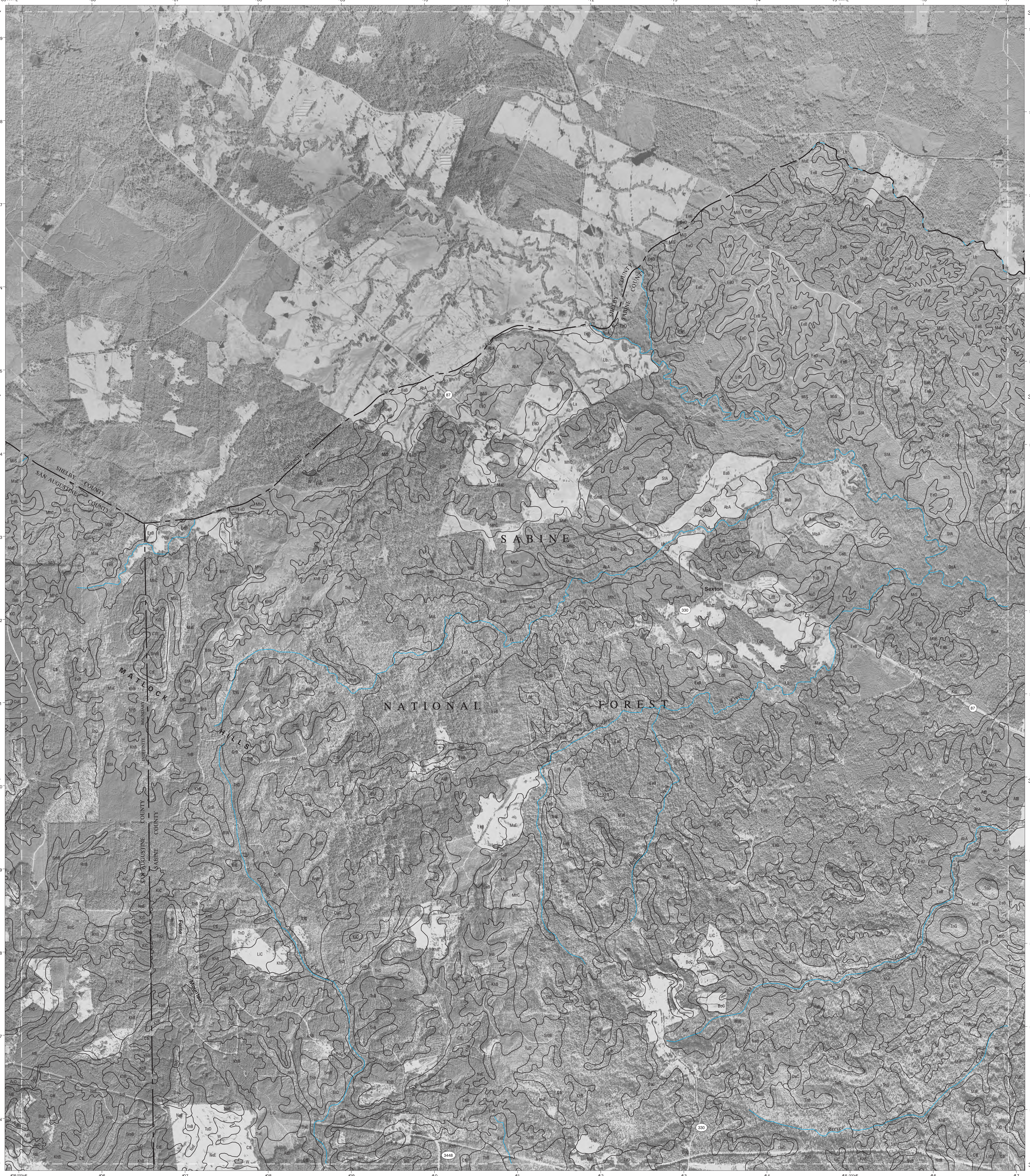
3		
5		7
11	12	13

3 NEUVILLE
5 SAN AUGUSTINE WEST
7 PATROON SOUTH
11 NORWOOD
12 CHINQUAPIN
13 GENEVA

INDEX TO ADJOINING 7.5 MAPS

SAN AUGUSTINE EAST, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

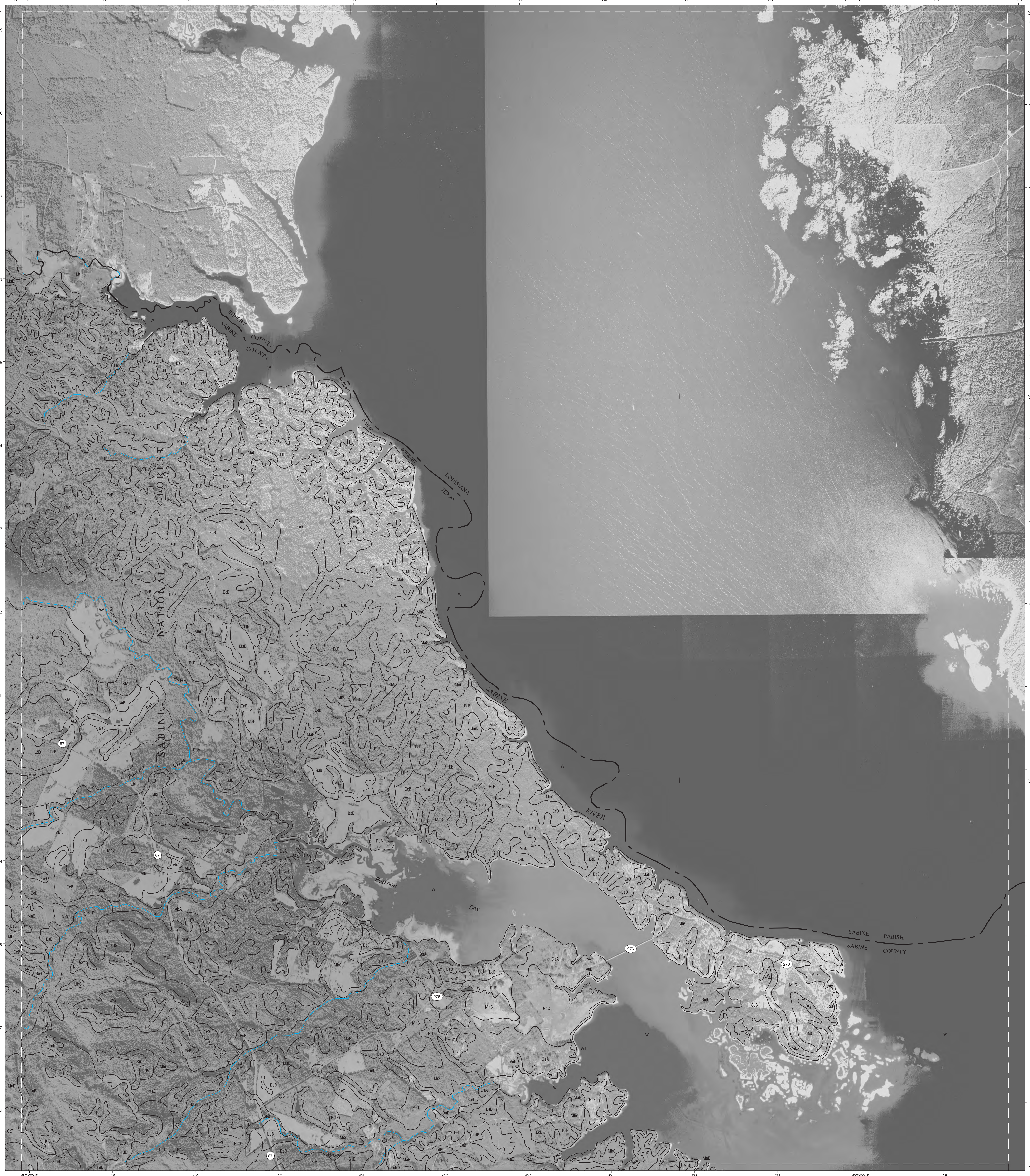
6		8
12	13	14

6 SAN AUGUSTINE EAST
8 EAST HAMILTON
12 CHINQUAPIN
13 GENEVA
14 MILAM

INDEX TO ADJOINING 7.5 MAPS

PATROON SOUTH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



SCALE 1:24000

MILES

FEET

KILOMETERS

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

7 PATROON SOUTH
9 BEECH BAYOU
13 GENEVA
14 MILAM
15 SALTER CREEK

INDEX TO ADJOINING 7.5 MAPS

EAST HAMILTON, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 8 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
BEECH BAYOU QUADRANGLE
SHEET NUMBER 9 OF 31

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

8 EAST HAMILTON
14 MILAM
15 SALTER CREEK

INDEX TO ADJOINING 7.5 MAPS

BEECH BAYOU, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 9 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 4, Chireno North

Joins sheet 5, San Augustine W

Joins sheet 11, Norwood

Joins sheet 16, Broaddus

Joins sheet 17, Harvey Creek

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

	4	5
		11
	16	17

4 CHIRENO NORTH
5 SAN AUGUSTINE W
11 NORWOOD
16 BROADDUS
17 HARVEY CREEK

INDEX TO ADJOINING 7.5 MAPS

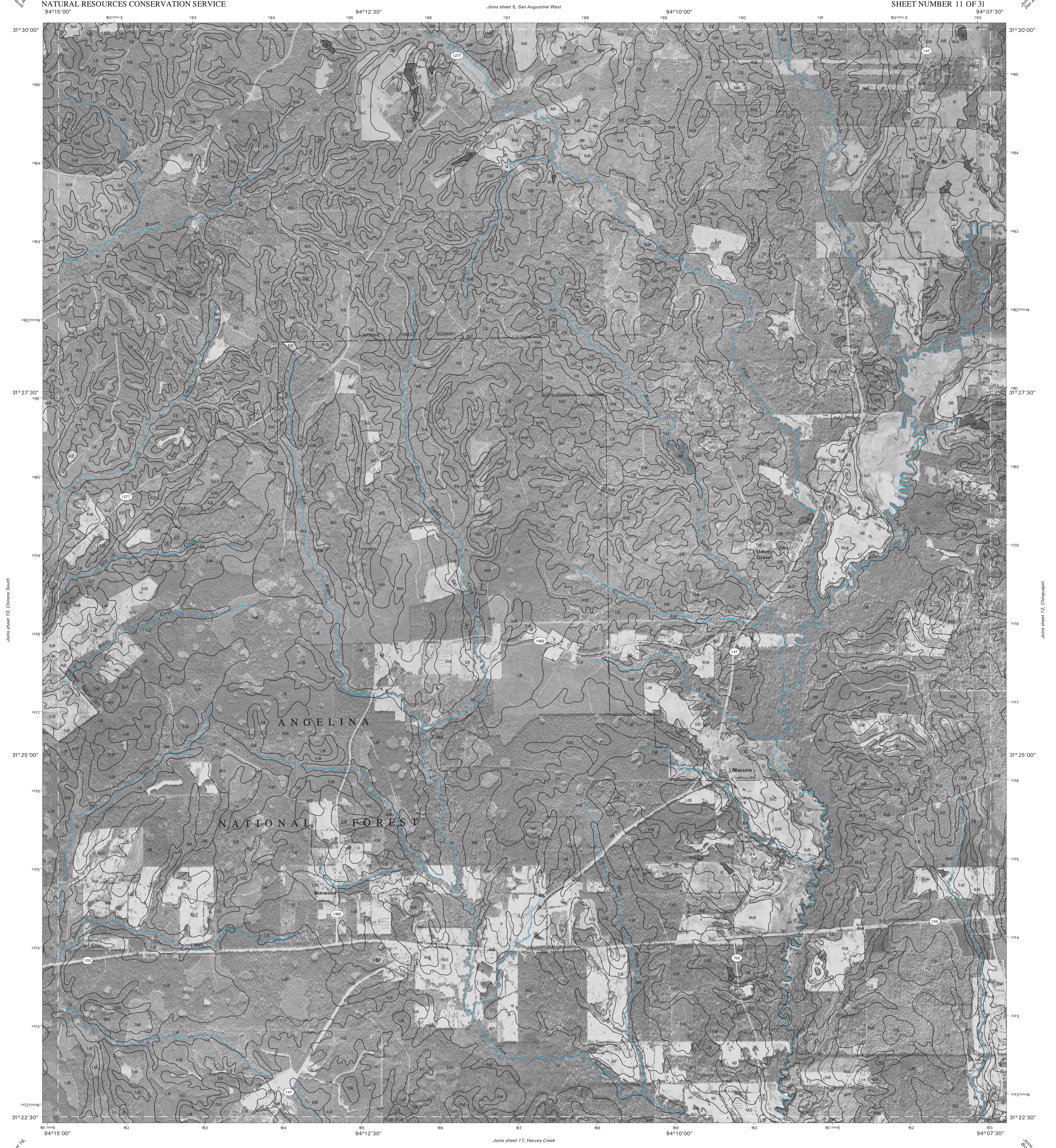
CHIRENO SOUTH, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 10 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

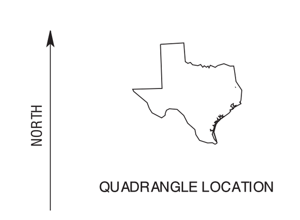
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
NORWOOD QUADRANGLE
SHEET NUMBER 11 OF 31



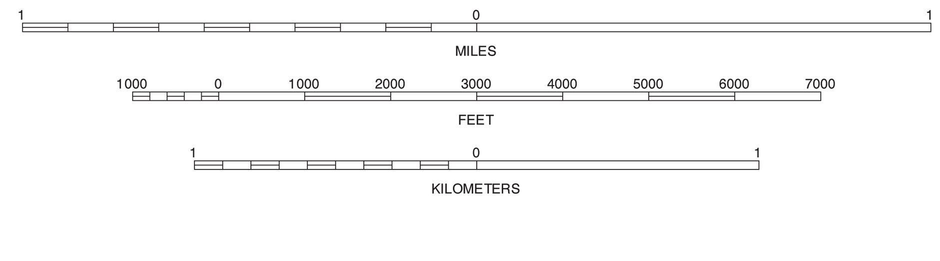
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

SCALE 1:24000



4	5	6
10		12
16	17	18

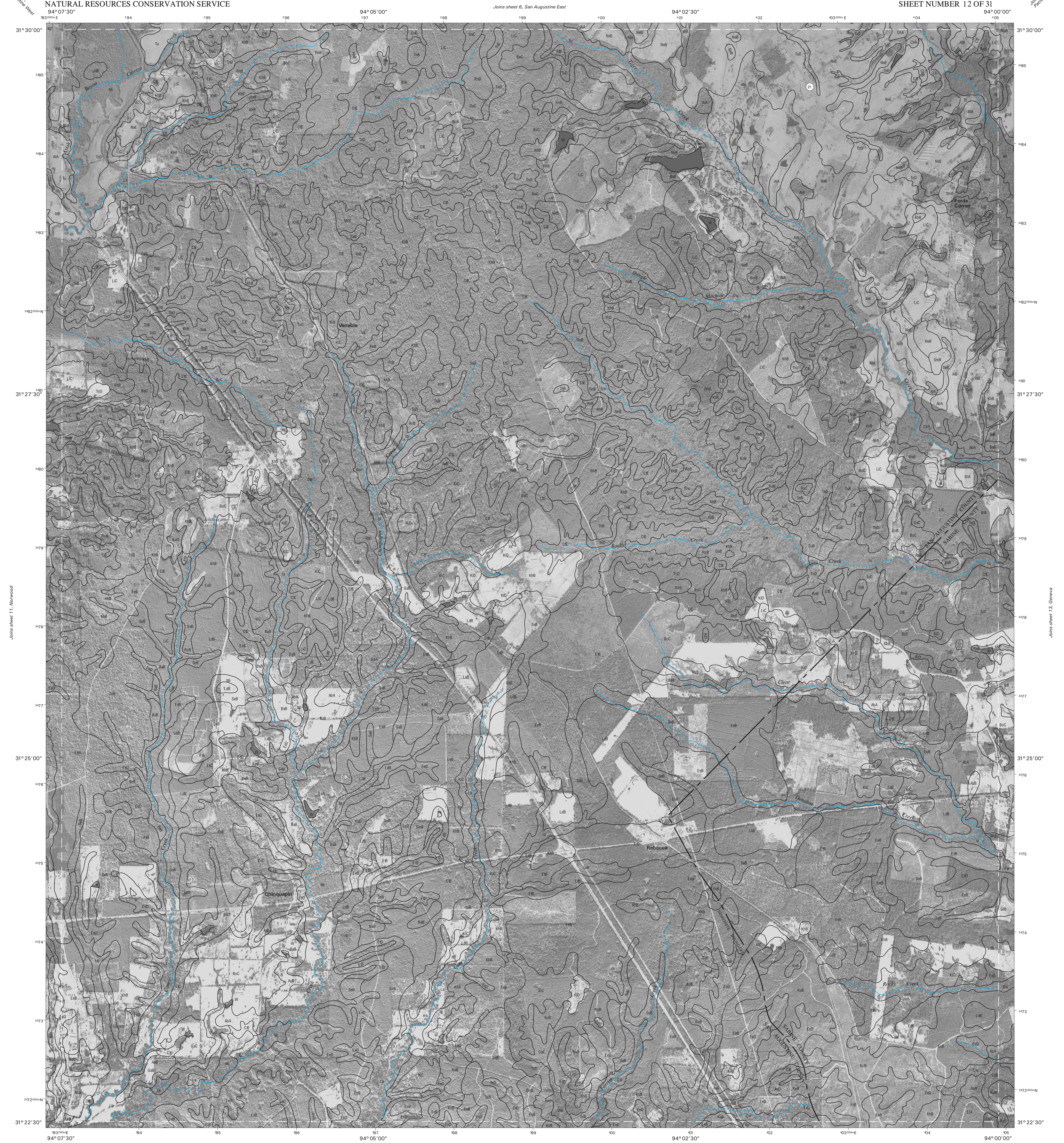
4 CHIRENO NORTH
5 SAN AUGUSTINE WEST
6 SAN AUGUSTINE E
10 CHIRENO SOUTH
12 CHINQUAPIN
16 BROADDUS
17 HARVEY CREEK
18 BRONSON

INDEX TO ADJOINING 7.5 MAPS

NORWOOD, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 11 OF 31

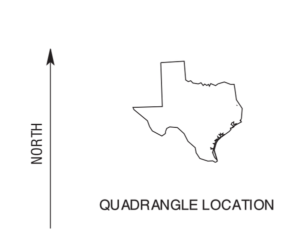
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:24000

MILES

FEET

KILOMETERS

5	6	7
11		13
17	18	19

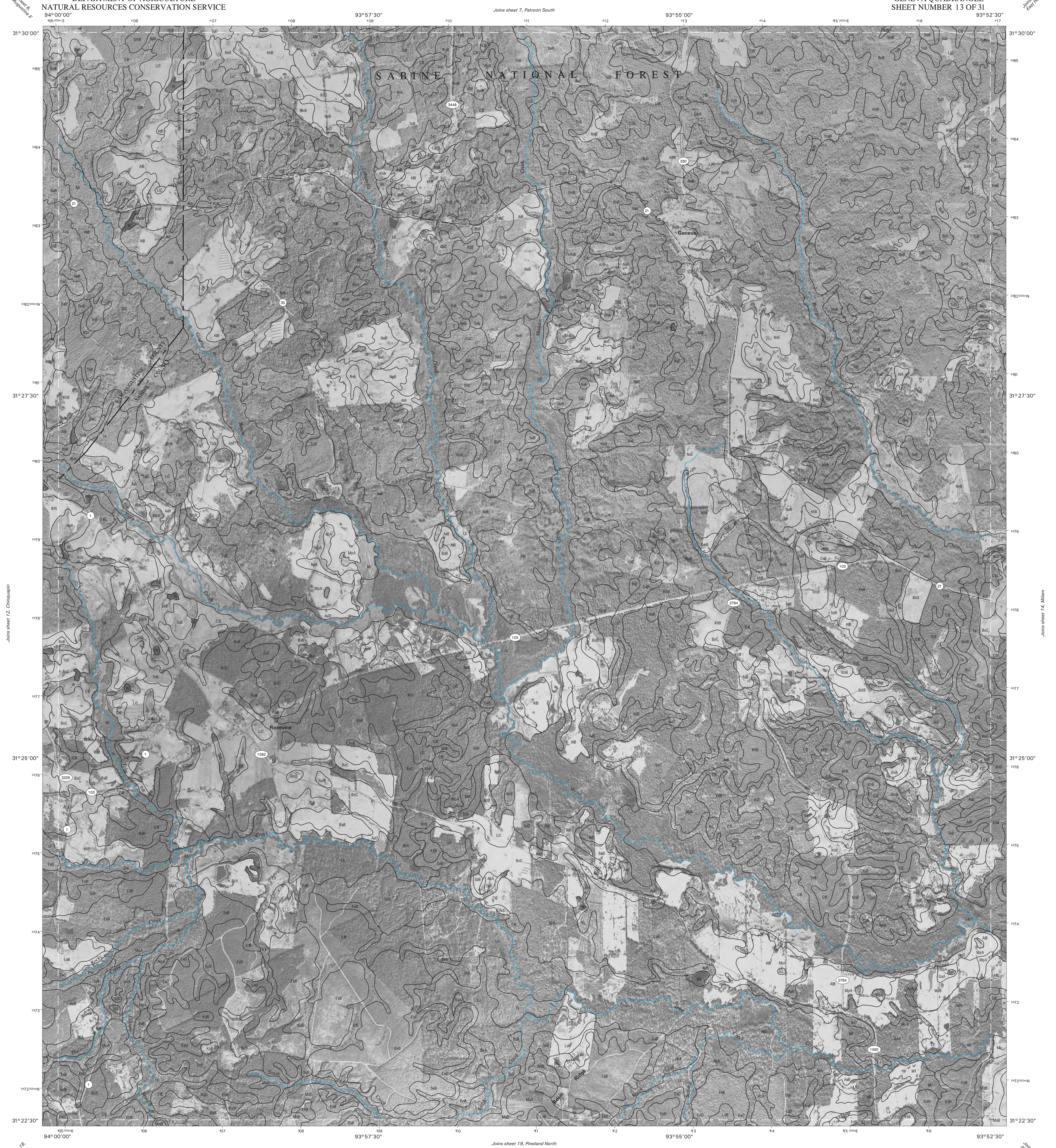
5 SAN AUGUSTINE WEST
6 SAN AUGUSTINE EAST
7 PATROON SOUTH
11 NORWOOD
13 GENEVA
17 HARVEY CREEK
18 BRONSON
19 PINELAND NORTH

INDEX TO ADJOINING 7.5 MAPS

CHINQUAPIN, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 12 OF 31

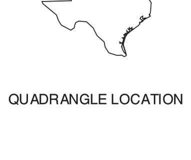
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

6	7	8
12		14
18	19	20

6 SAN AUGUSTINE E
7 PATROON SOUTH
8 EAST HAMILTON
12 CHINQUAPIN
14 MILAM
18 BRONSON
19 PINELAND NORTH
20 HEMPHILL

INDEX TO ADJOINING 7.5 MAPS

GENEVA, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 13 OF 31

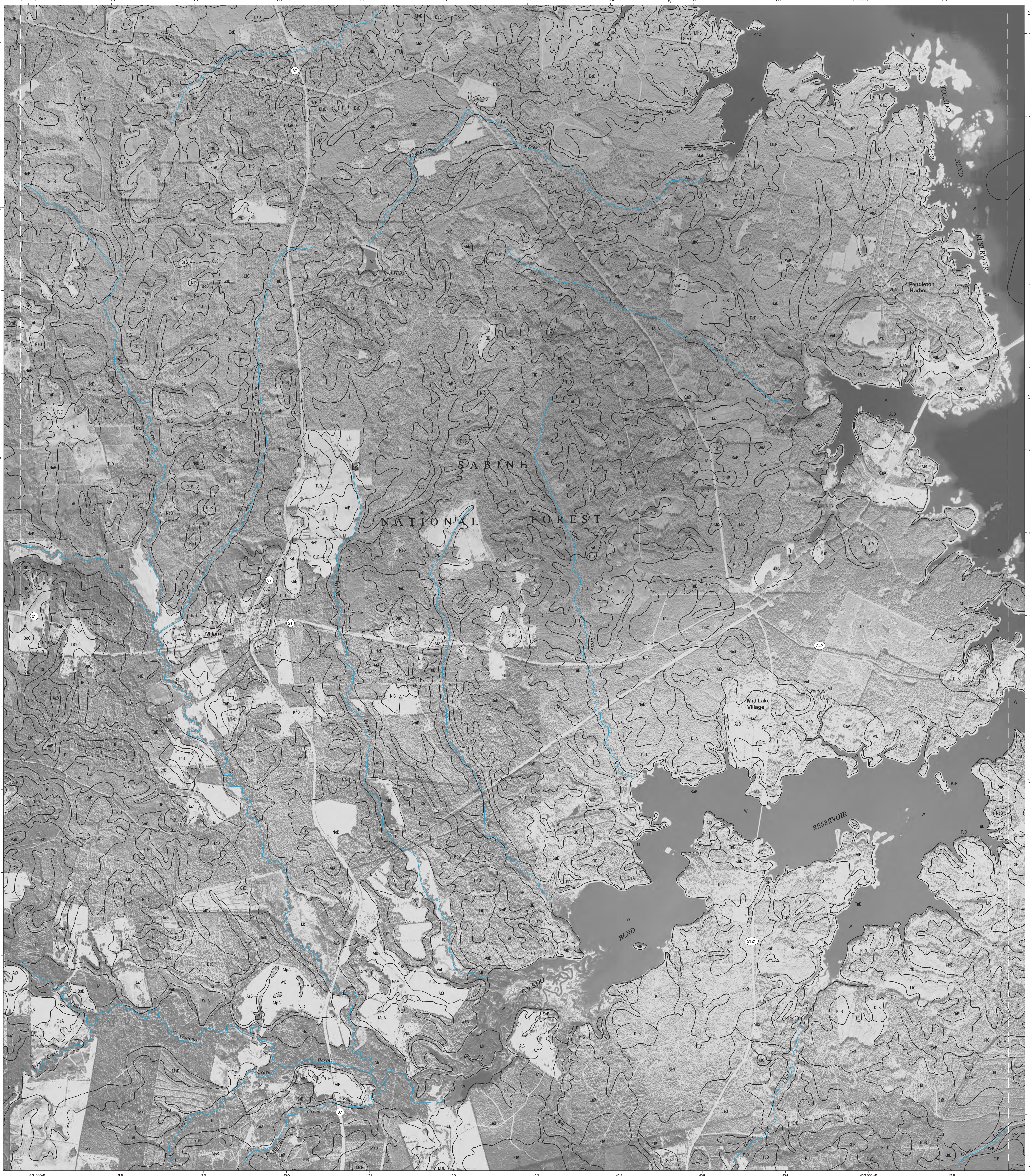
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 7, Patroon South

Joins sheet 8, East Hamilton

Joins sheet 9, Beech Bayou



Joins sheet 19, Pineland North

Joins sheet 20, Hemphill

Joins sheet 21, Negreet SW

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

7	8	9
13		15
19	20	21

7 PATROON SOUTH
8 EAST HAMILTON
9 BEECH BAYOU
13 GENEVA
15 SALTER CREEK
19 PINELAND NORTH
20 HEMPHILL
21 NEGREET SW

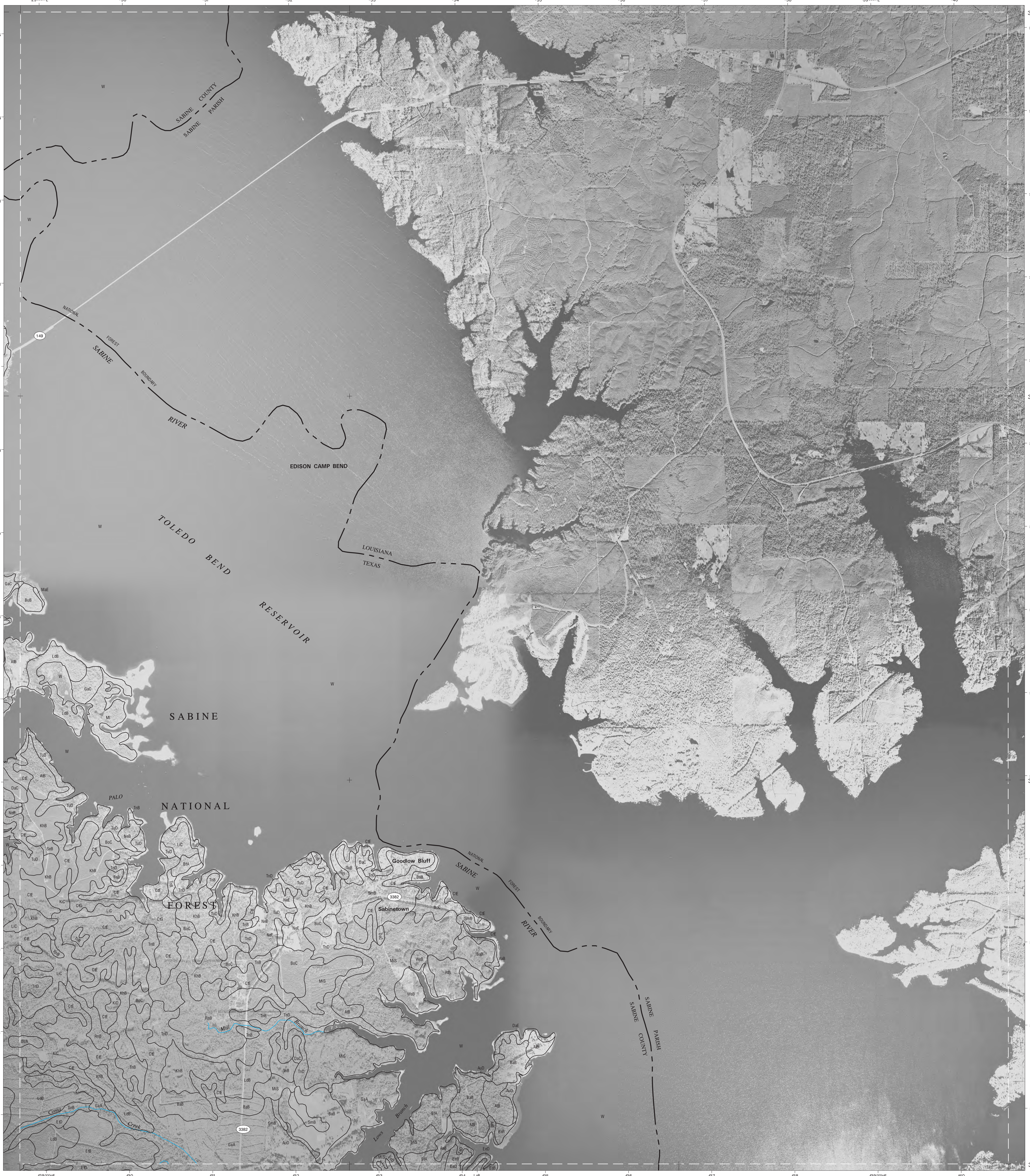
INDEX TO ADJOINING 7.5 MAPS

MILAM, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 14 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
SALTER CREEK QUADRANGLE
SHEET NUMBER 15 OF 31



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

8	9	
14		
20	21	22

8 EAST HAMILTON
9 BEECH BAYOU
14 MILAM
20 HEMPHILL
21 NEGREET SW
22 TORO

INDEX TO ADJOINING 7.5 MAPS

SALTER CREEK, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 15 OF 31

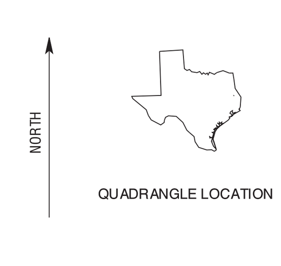
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

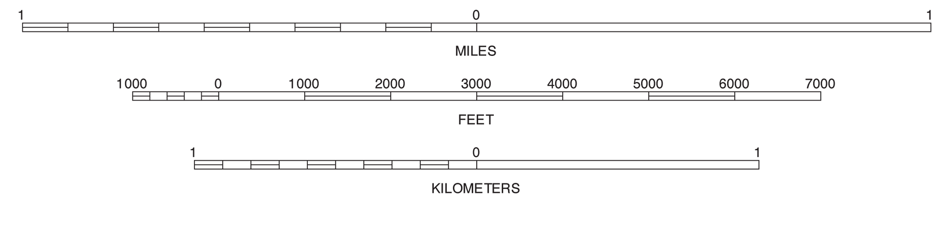
SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
BROADDUS QUADRANGLE
SHEET NUMBER 16 OF 31

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:24000



	10	11
	■	17
	23	24

10 CHIRENO SOUTH
11 NORWOOD
17 HARVEY CREEK
23 CASSELLS-BOYKIN PARK
24 VEACH

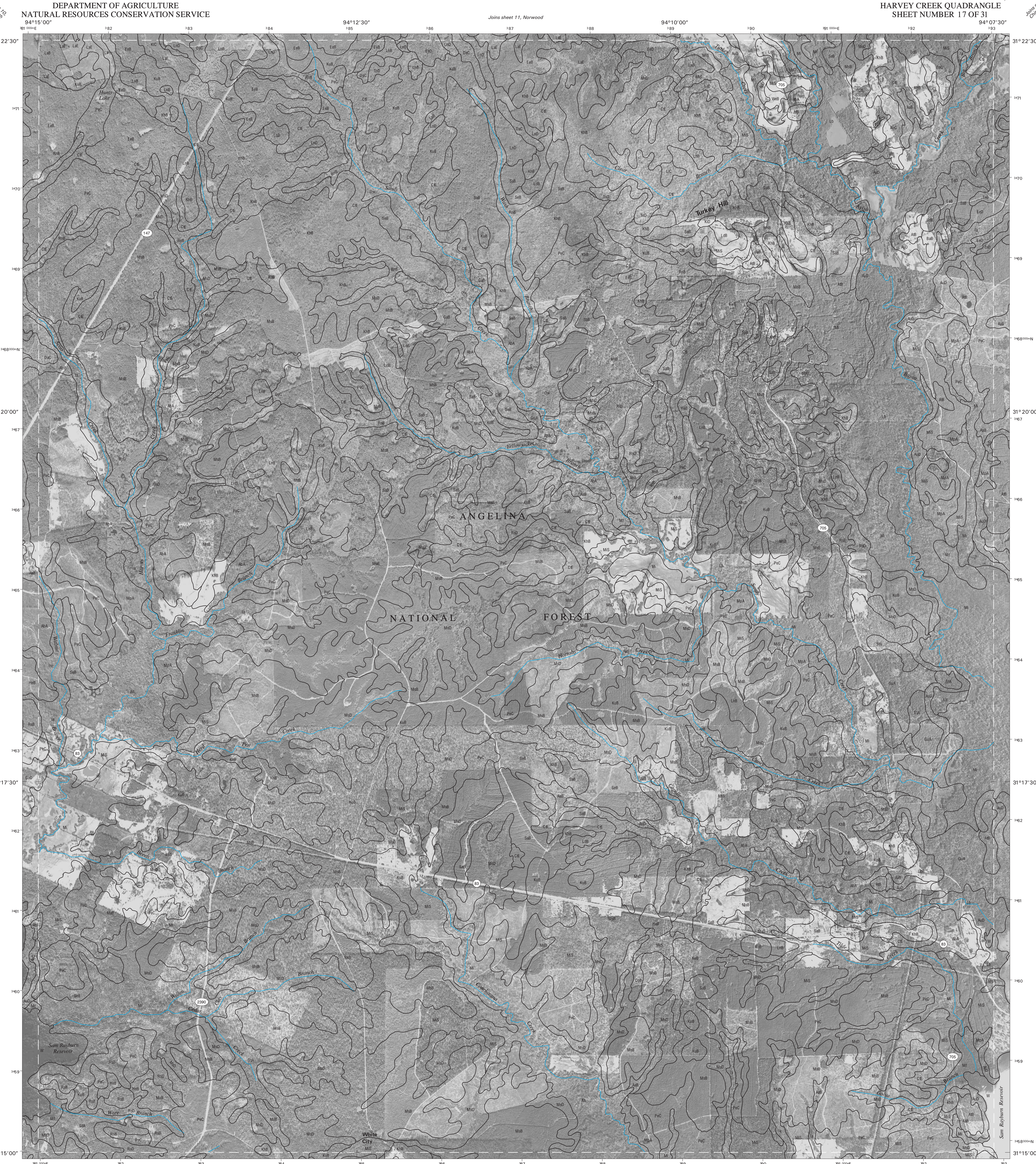
INDEX TO ADJOINING 7.5 MAPS

BROADDUS, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 16 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
HARVEY CREEK QUADRANGLE
SHEET NUMBER 17 OF 31



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETERS

10	11	12
16		18
23	24	25

10 CHIRENO SOUTH
11 NORWOOD
12 CHINQUAPIN
16 BROADDUS
18 BRONSON
23 CASSELLS-BOYKIN PARK
24 VEACH
25 BUCK BAY

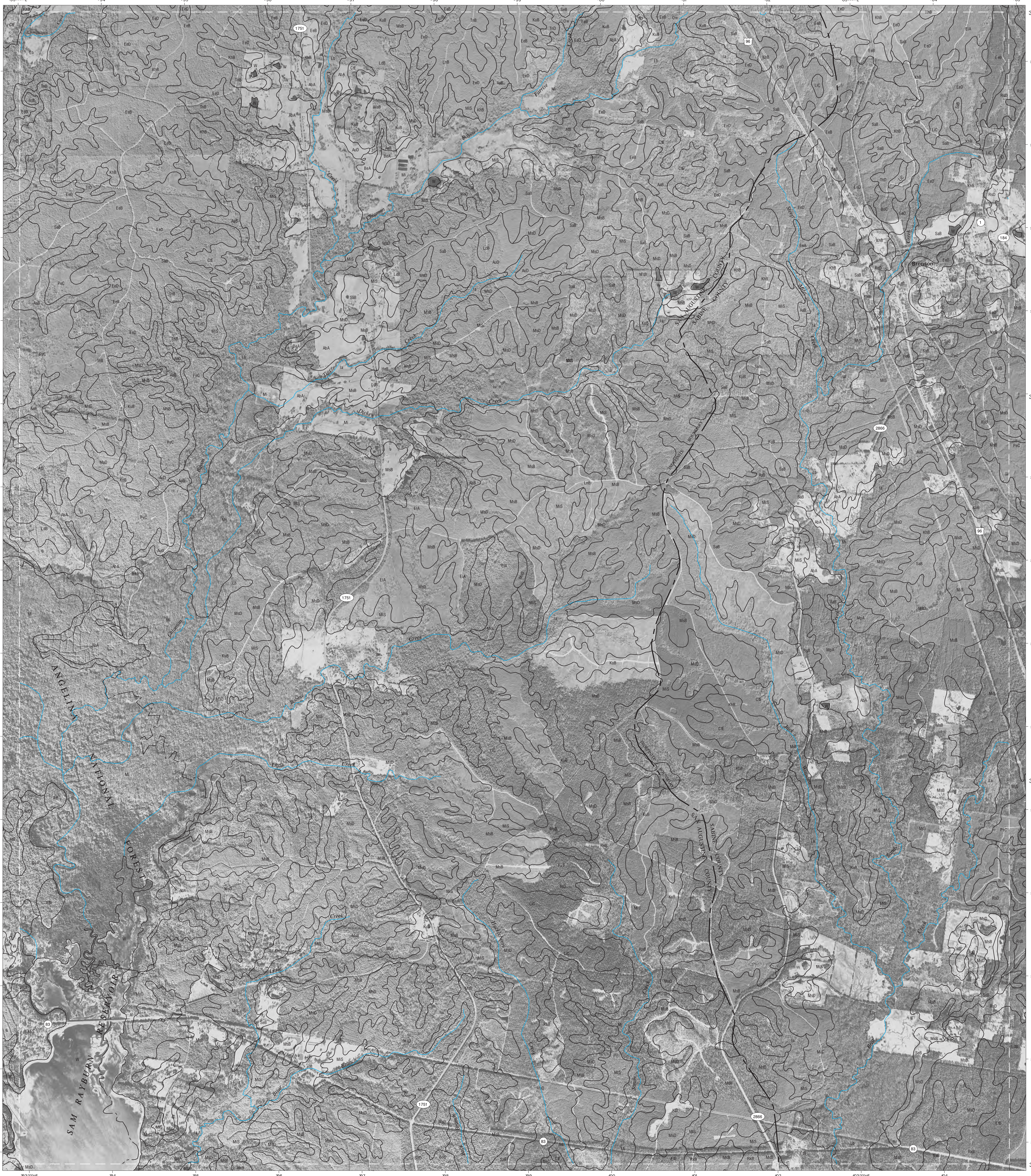
INDEX TO ADJOINING 7.5 MAPS

HARVEY CREEK, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 17 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 11, Norwood
Joins sheet 12, Chinquapin
Joins sheet 13, Geneva
Joins sheet 17, Harvey Creek
Joins sheet 19, Pineland North
Joins sheet 24, Veach
Joins sheet 25, Buck Bay
Joins sheet 26, Pineland South



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES: 1 0 1

FEET: 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS: 1 0 1

11	12	13
17		19
24	25	26

11 NORWOOD
12 CHINQUAPIN
13 GENEVA
17 HARVEY CREEK
19 PINELAND NORTH
24 VEACH
25 BUCK BAY
26 PINELAND SOUTH

INDEX TO ADJOINING 7.5 MAPS

BRONSON, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 18 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

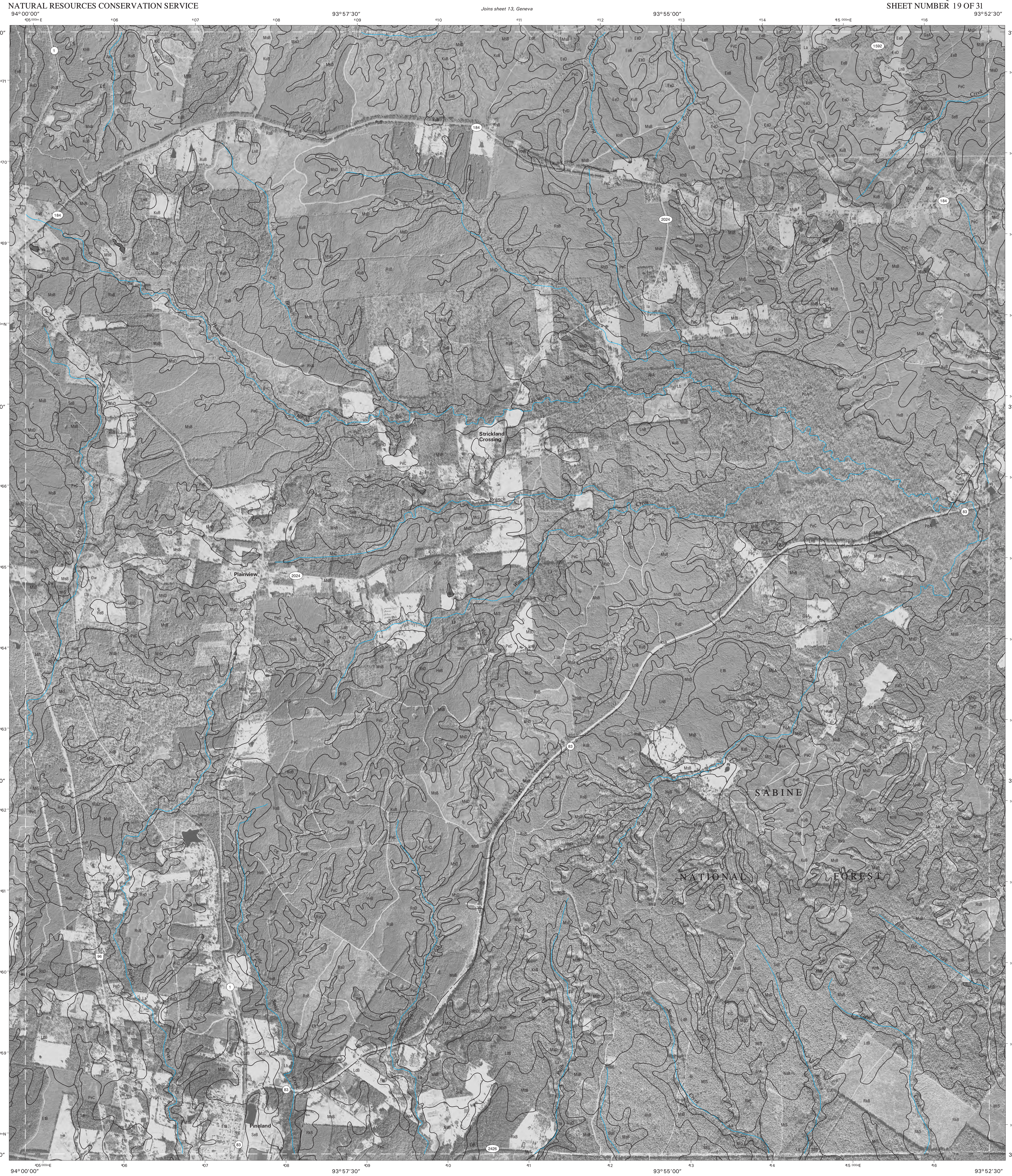
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
PINELAND NORTH QUADRANGLE
SHEET NUMBER 19 OF 31

Joins sheet 12, Chinquapin

Joins sheet 13, Geneva

Joins sheet 14, Milam



Joins sheet 18, Bronson

Joins sheet 20, Hemphill

Joins sheet 25, Buck Bay

Joins sheet 26, Pineland South

Joins sheet 27, Hurricane Creek

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

12	13	14
18		20
25	26	27

12 CHINQUAPIN
13 GENEVA
14 MILAM
18 BRONSON
20 HEMPHILL
25 BUCK BAY
26 PINELAND SOUTH
27 HURRICANE CREEK

INDEX TO ADJOINING 7.5 MAPS

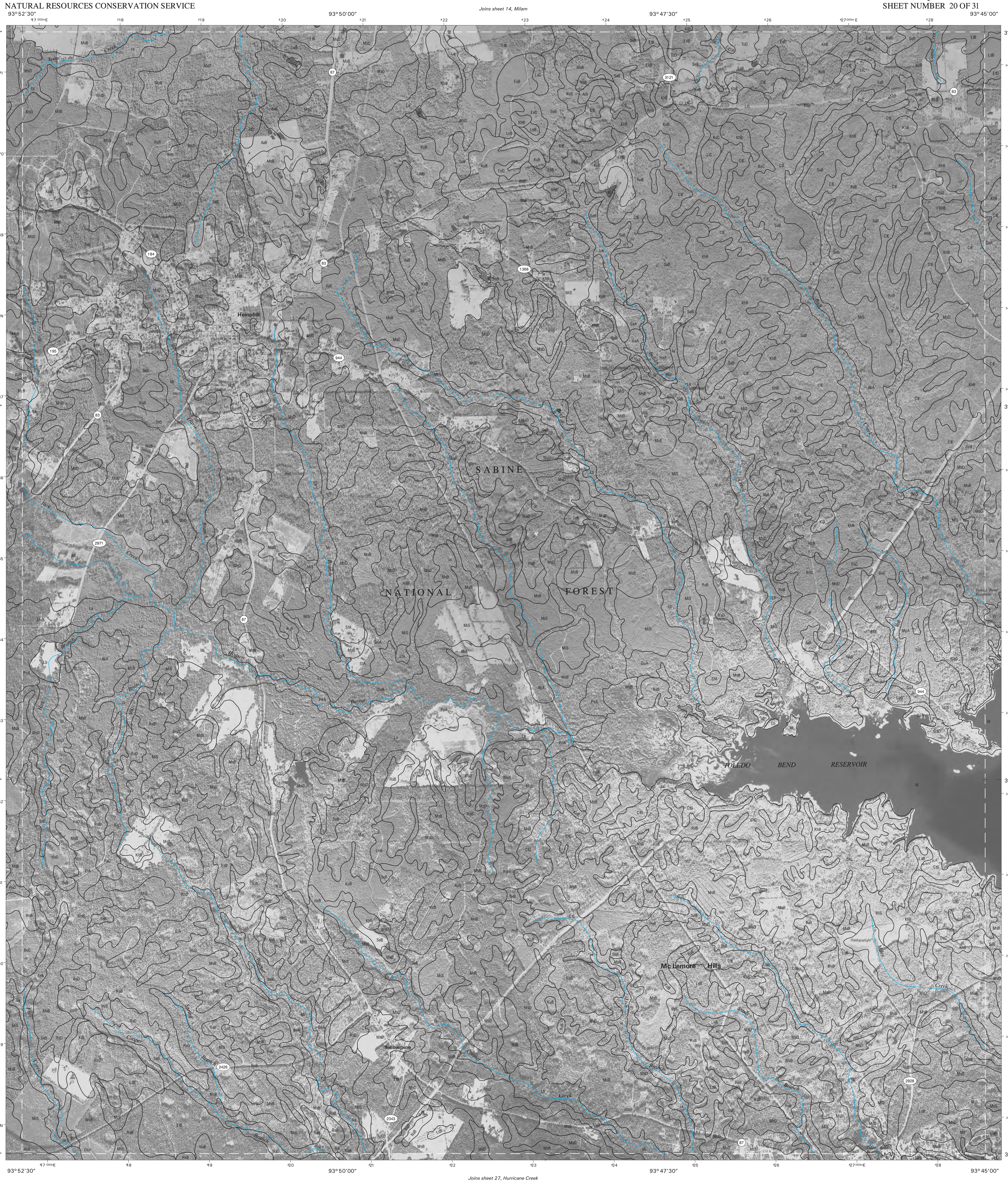
PINELAND NORTH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 19 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 13, Geneva

Joins sheet 14, Milam

Joins sheet 15, Salter Creek



Joins sheet 19, Pineland North

Joins sheet 21, Negreet SW

Joins sheet 26, Pineland South

Joins sheet 27, Hurricane Creek

Joins sheet 28, Fairmount

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

13	14	15
19		21
26	27	28

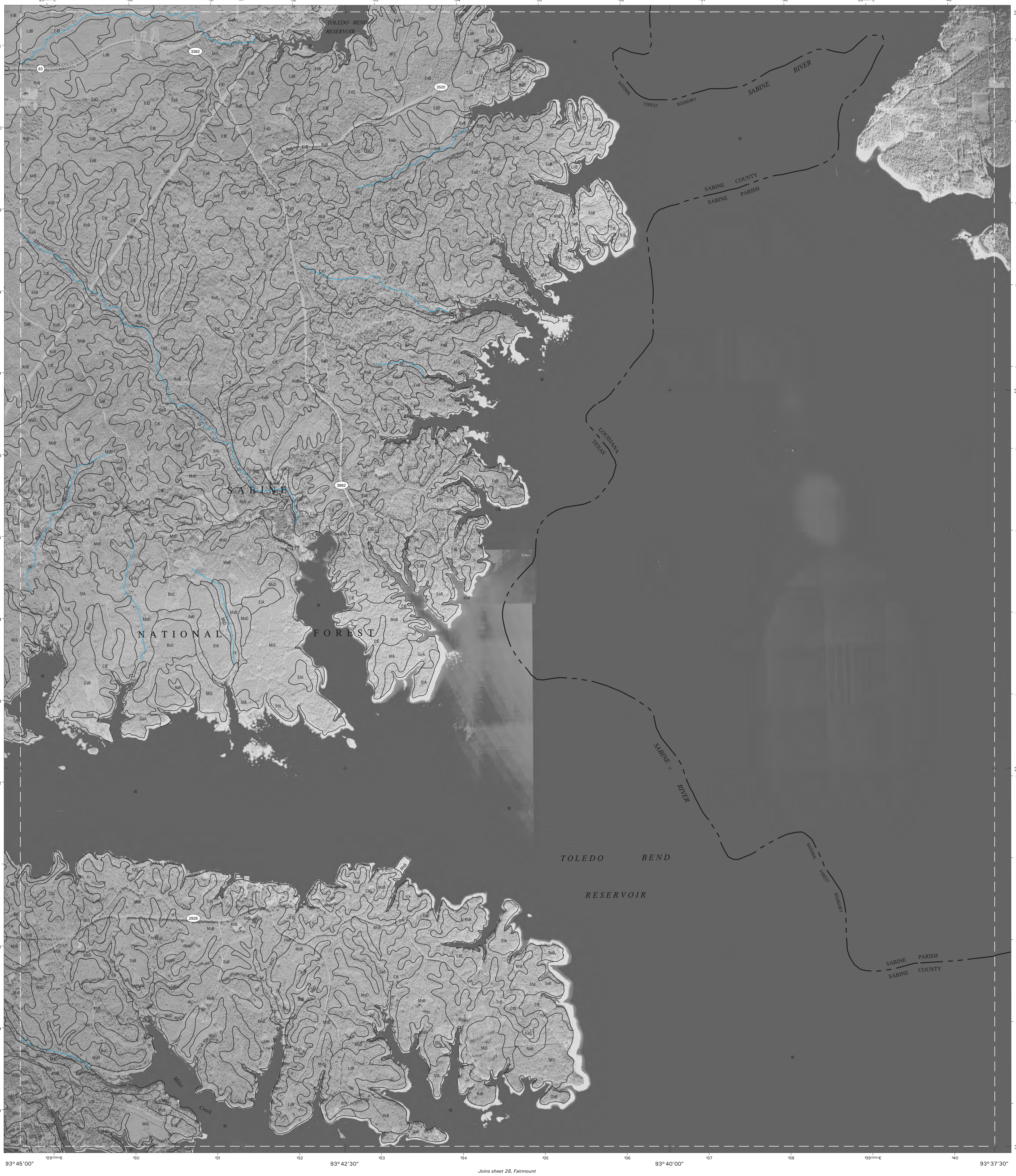
13 GENEVA
14 MILAM
15 SALTER CREEK
19 PINELAND NORTH
21 NEGREET SW
26 PINELAND SOUTH
27 HURRICANE CREEK
28 FAIRMOUNT

INDEX TO ADJOINING 7.5 MAPS

HEMPHILL, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 20 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

14	15	
20		22
27	28	29

14 MILAM
15 SALTER CREEK
20 HEMPHILL
22 TORO
27 HURRICANE CREEK
28 FAIRMOUNT
29 HADDENS

INDEX TO ADJOINING 7.5 MAPS

NEGREET SW, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 21 OF 31

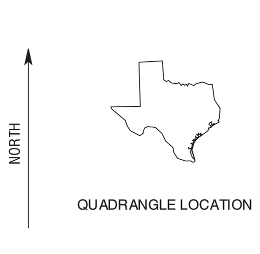
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
TORO QUADRANGLE
SHEET NUMBER 22 OF 31

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



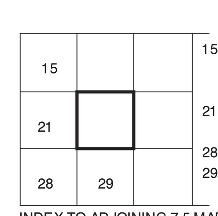
QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS



INDEX TO ADJOINING 7.5 MAPS

TORO, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 22 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
CASSELLS-BOYKIN PARK QUADRANGLE
SHEET NUMBER 23 OF 31

Joins sheet 16, Broaddus

Joins sheet 17, Harvey Creek

Joins sheet 24, Veach

94° 22′30″ 94° 20′00″ 94° 17′30″ 94° 15′00″

31° 15′00″ 31° 12′30″ 31° 10′00″ 31° 07′30″

Joins sheet 30, Ebenezer

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

	16	17	16 BROADDUS 17 HARVEY CREEK
	■	24	24 VEACH
		30	30 EBENEZER

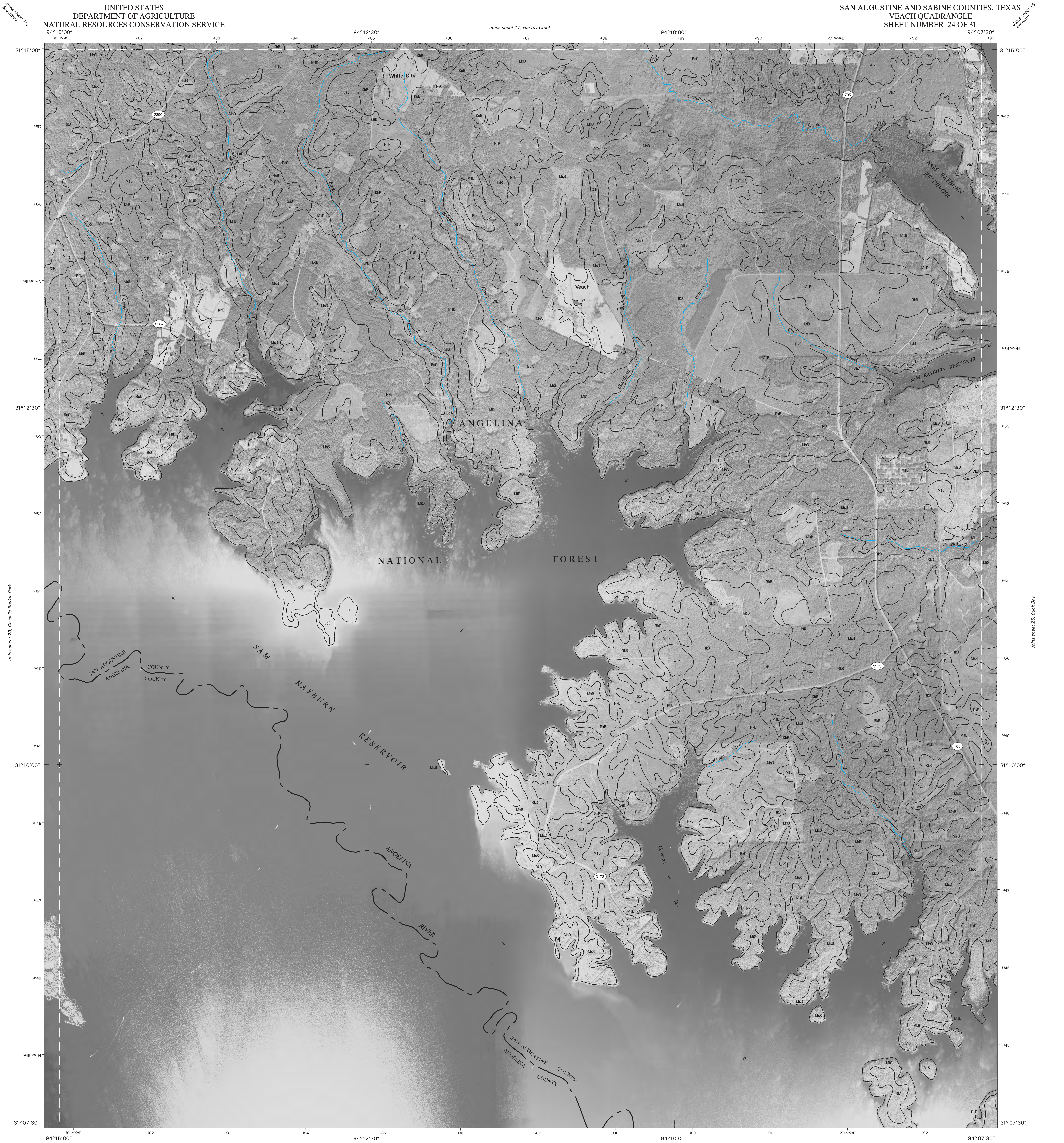
INDEX TO ADJOINING 7.5 MAPS

CASSELLS-BOYKIN PARK, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 23 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

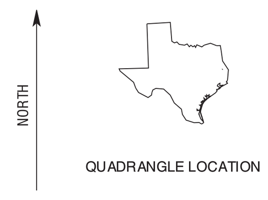
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
VEACH QUADRANGLE
SHEET NUMBER 24 OF 31



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:24000

MILES

FEET

KILOMETERS

16	17	18
23		25
	30	31

16 BROADDUS
17 HARVEY CREEK
18 BRONSON
23 CASSELLS-BOYKIN PARK
25 BUCK BAY
30 EBENEZER
31 MCGEE BEND

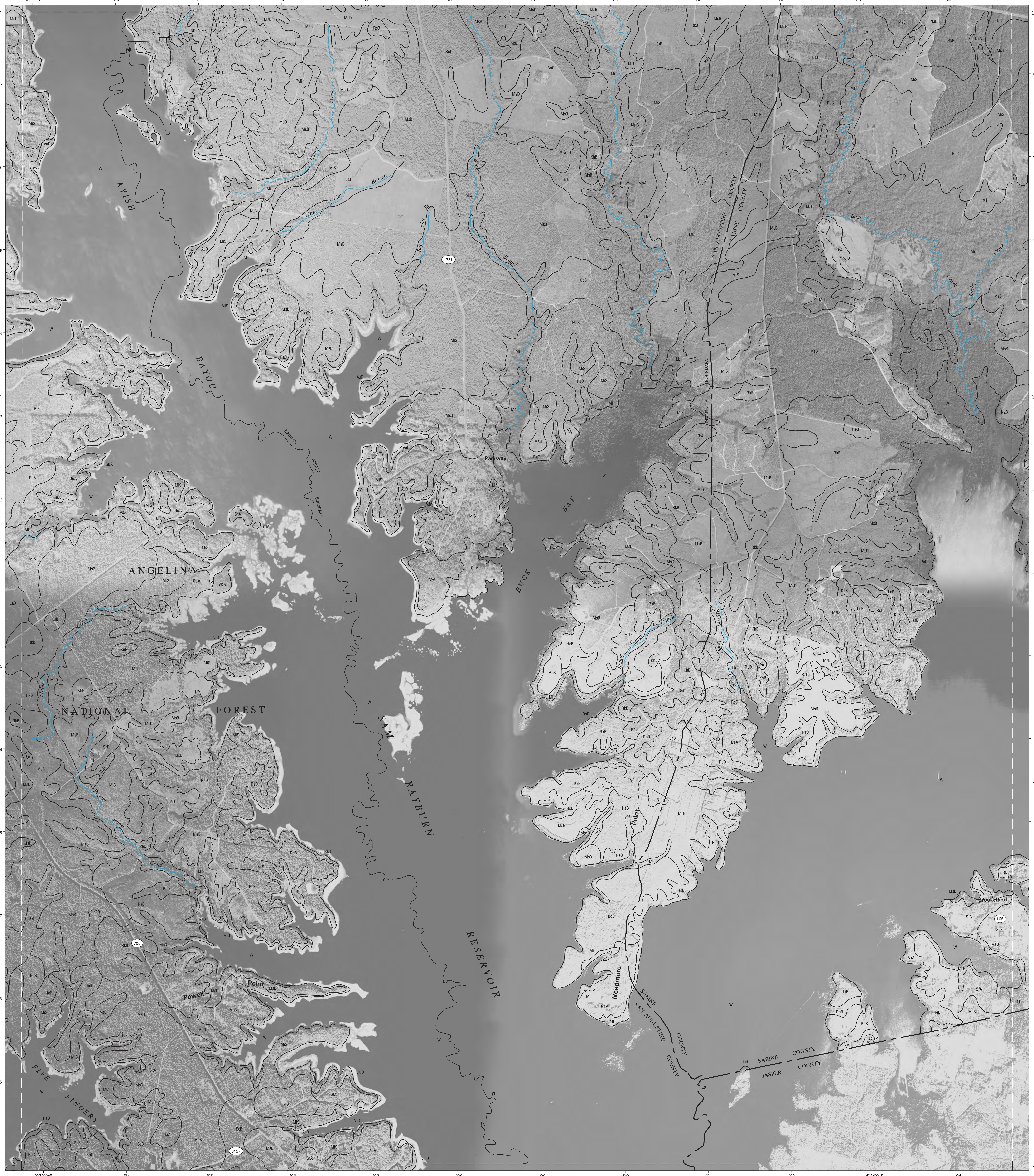
INDEX TO ADJOINING 7.5 MAPS

VEACH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 24 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
BUCK BAY QUADRANGLE
SHEET NUMBER 25 OF 31



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

INDEX TO ADJOINING 7.5 MAPS

17 HARVEY CREEK
18 BRONSON
19 PINELAND NORTH
24 VEACH
26 PINELAND SOUTH
30 EBENEZER
31 MCGEE BEND

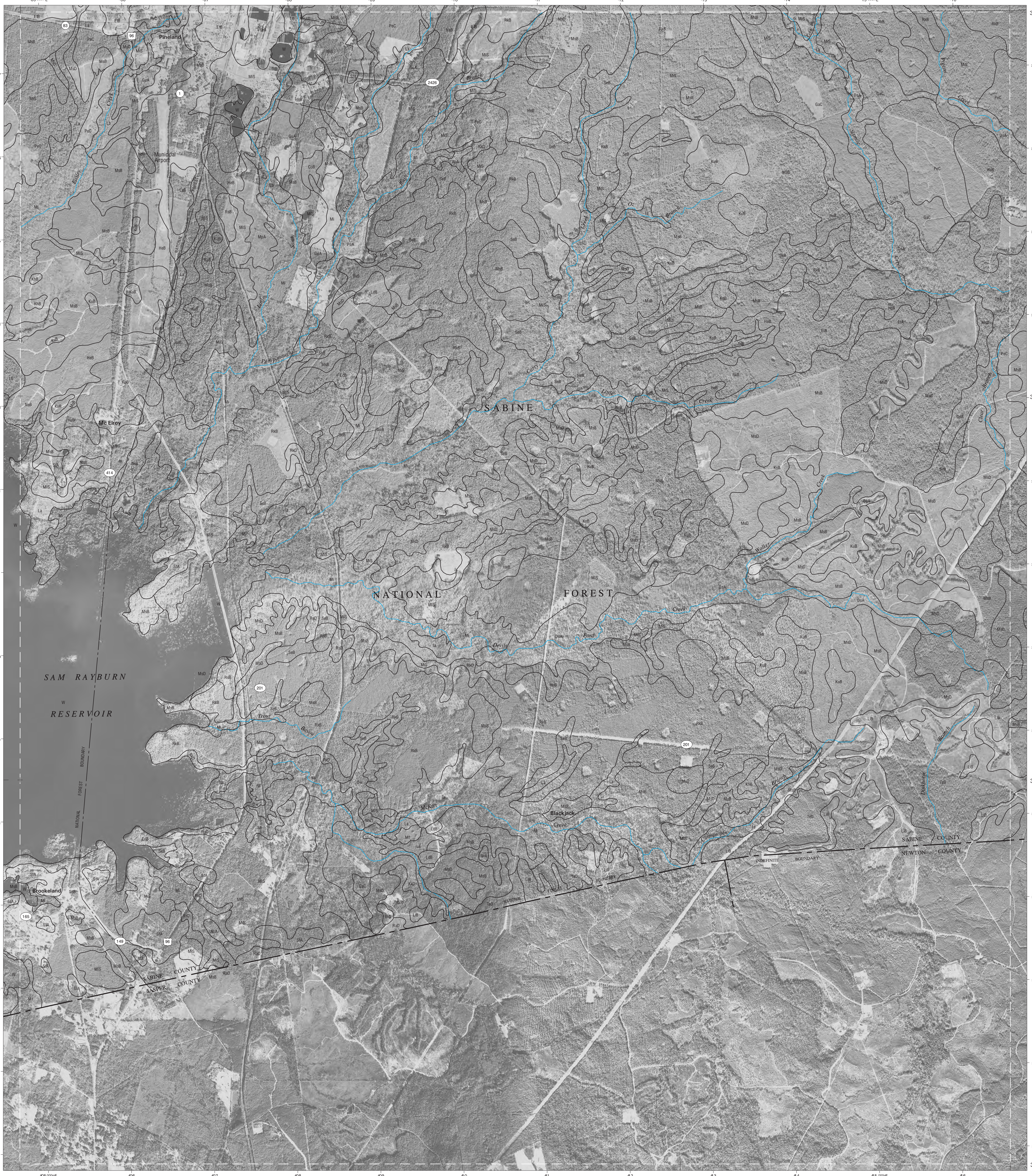
BUCK BAY, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 25 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
PINELAND SOUTH QUADRANGLE
SHEET NUMBER 26 OF 31



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

18 BRONSON
19 PINELAND NORTH
20 HEMPHILL
25 BUCK BAY
27 HURRICANE CREEK
31 MCGEE BEND

INDEX TO ADJOINING 7.5 MAPS

PINELAND SOUTH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 26 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
HURRICANE CREEK QUADRANGLE
SHEET NUMBER 27 OF 31

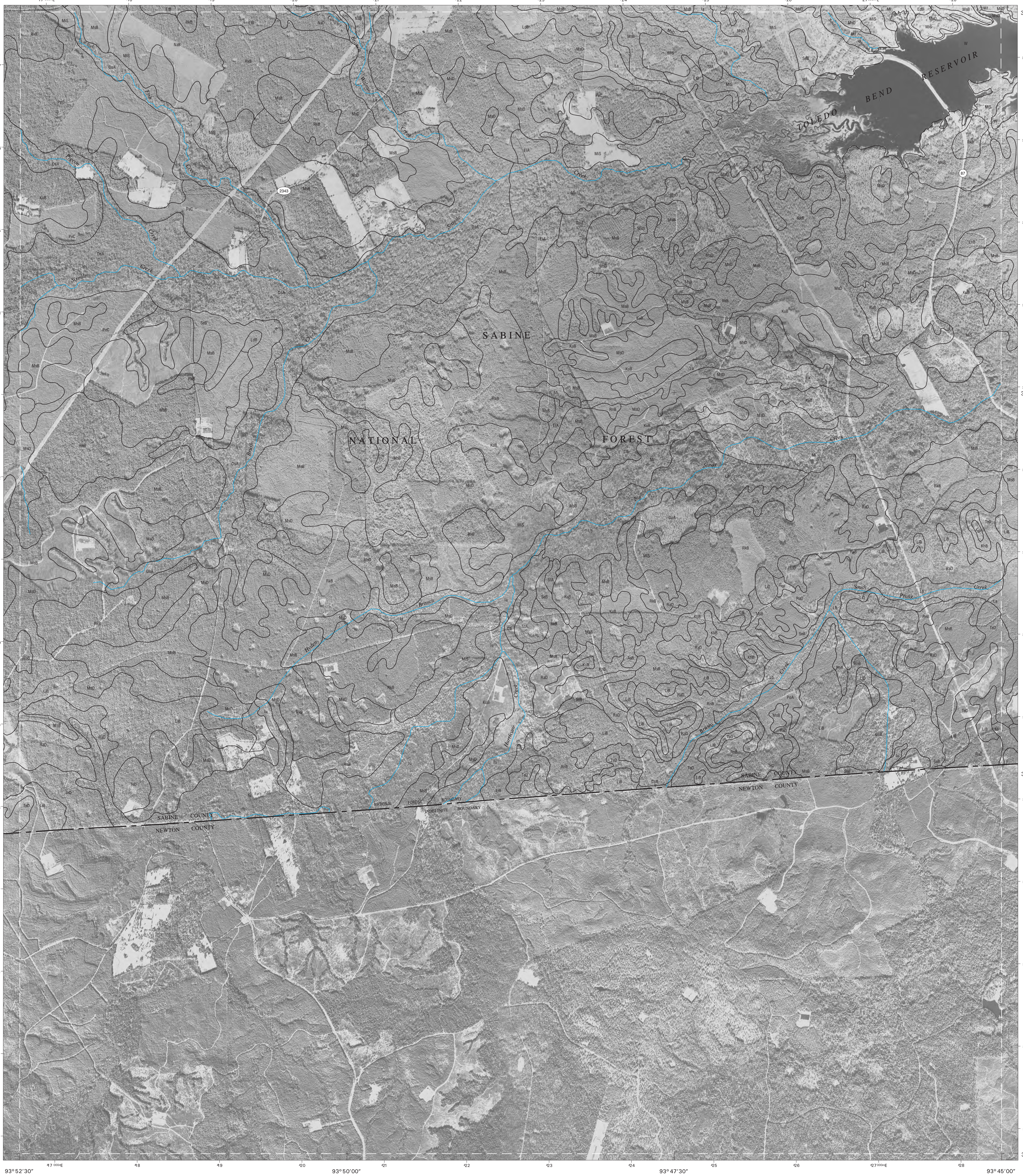
Joins sheet 19, Pineland North

Joins sheet 20, Hemphill

Joins sheet 21, Negreet SW

Joins sheet 26, Pineland South

Joins sheet 28, Fairmount



93° 52′30″ 93° 50′00″ 93° 47′30″ 93° 45′00″
31° 15′00″ 31° 12′30″ 31° 10′00″ 31° 07′30″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

19	20	21
26		28

19 PINELAND NORTH
20 HEMPHILL
21 NEGREET SW
26 PINELAND SOUTH
28 FAIRMOUNT

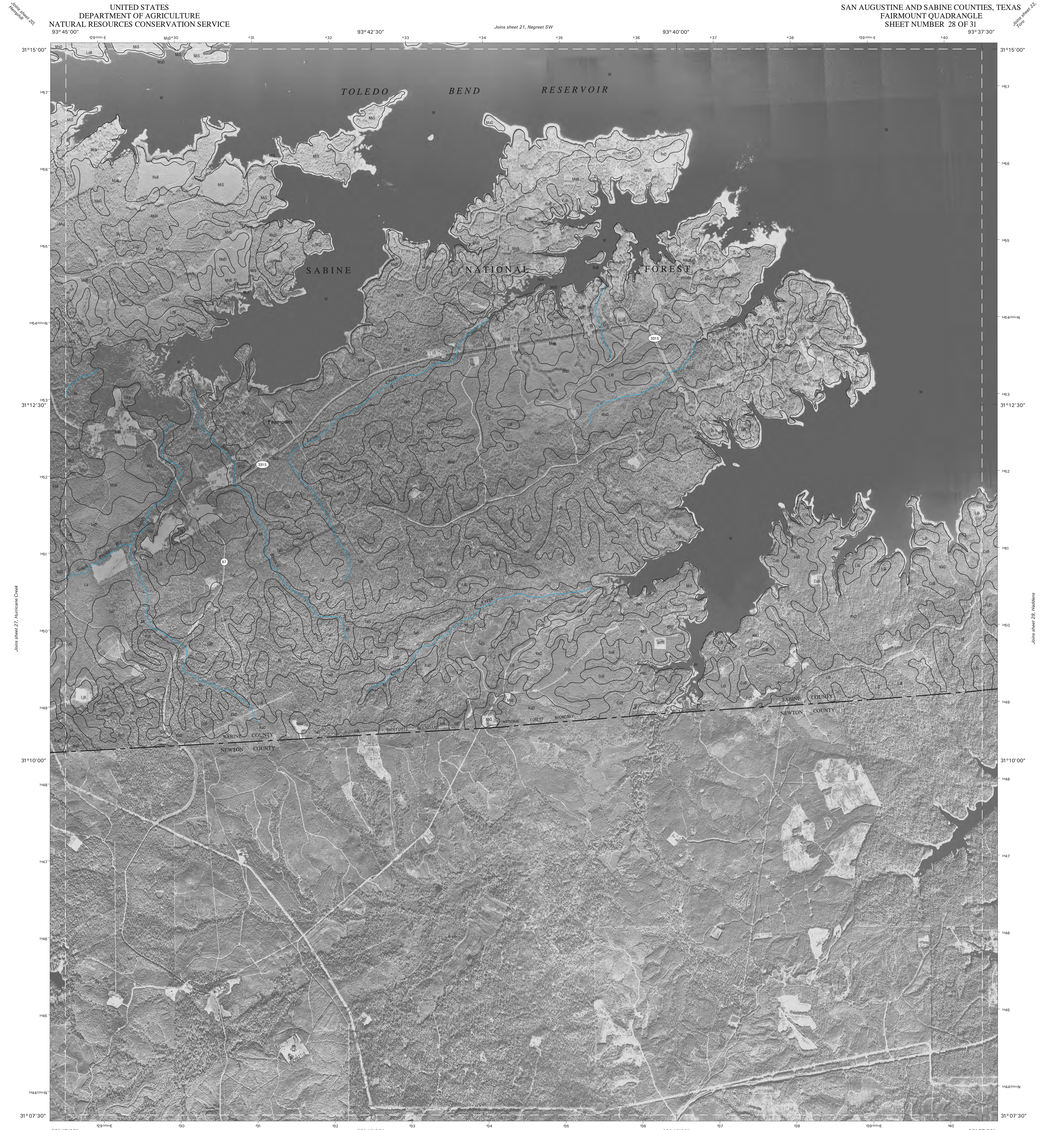
INDEX TO ADJOINING 7.5 MAPS

HURRICANE CREEK, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 27 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

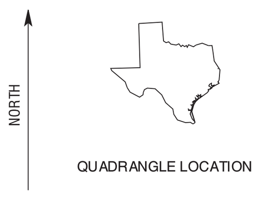
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

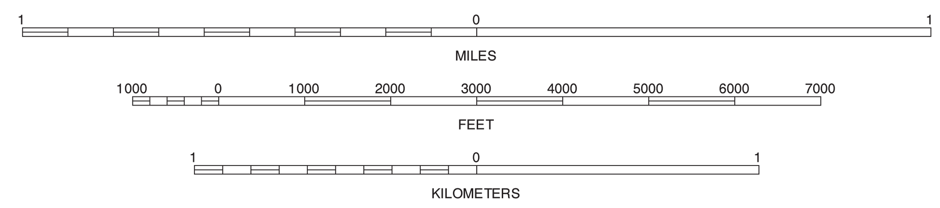
SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
FAIRMOUNT QUADRANGLE
SHEET NUMBER 28 OF 31



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.





20	21	22
27		29

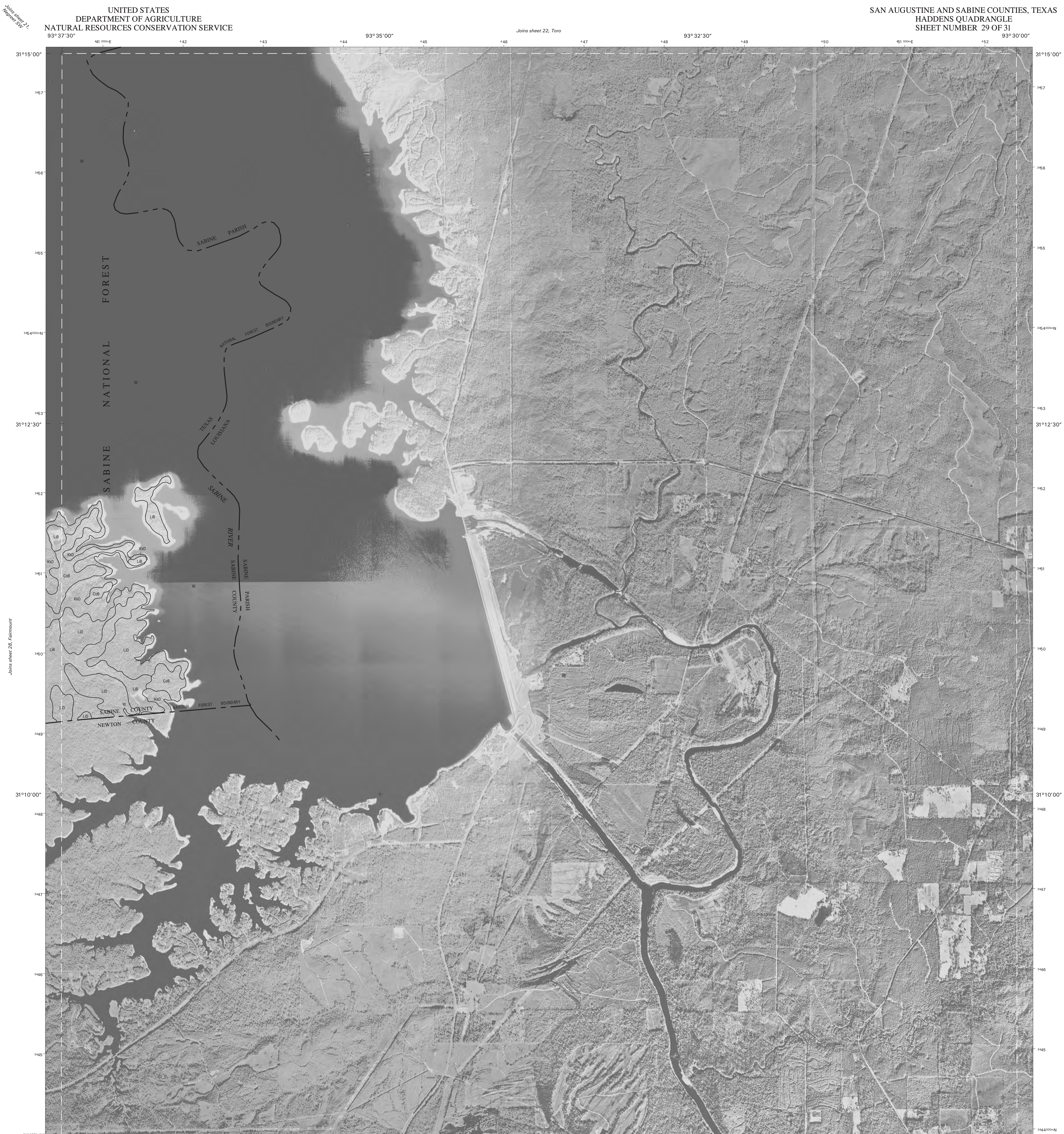
20 HEMPHILL
21 NEGREET SW
22 TORO
27 HURRICANE CREEK
29 HADDENS

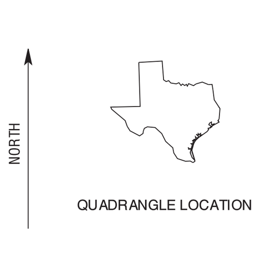
INDEX TO ADJOINING 7.5 MAPS

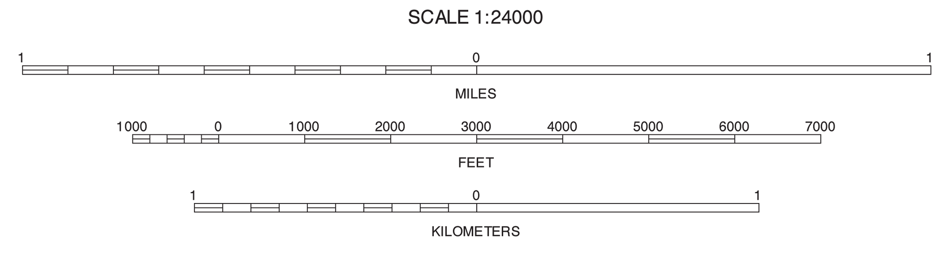
FAIRMOUNT, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 28 OF 31

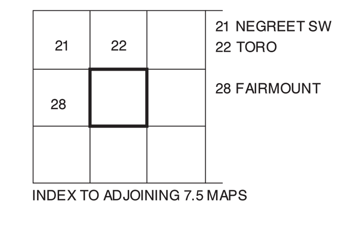
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE









This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

HADDENS, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 29 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
EBENEZER QUADRANGLE
SHEET NUMBER 30 OF 31

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are approximately positioned. Digital data are provided for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

23	24	25
		31

23 CASSELLS-BOYKIN PARK
24 VEACH
25 BUCK BAY
31 MCGEE BEND

INDEX TO ADJOINING 7.5 MAPS

EBENEZER, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 30 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAN AUGUSTINE AND SABINE COUNTIES, TEXAS
MCGEE BEND QUADRANGLE
SHEET NUMBER 31 OF 31

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 2001 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 15. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

24	25	26
30		

24 VEACH
25 BUCK BAY
26 PINELAND S
30 EBENEZER

INDEX TO ADJOINING 7.5 MAPS

MCGEE BEND, TEXAS

7.5 MINUTE SERIES
SHEET NUMBER 31 OF 31

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.